AD-A099 963 FEDERAL AVIATION ADMINISTRATION TECHNICAL CENTER ATL-ETC F/6 1/2 MIAMI INTERNATIONAL AIRPORT DATA PACKAGE NUMBER 2. AIRPORT IMPR-ETC(U) JAN 79 UNCLASSIFIED NL | o⊩ | 40 A 799963

12796

INTERNATIONAL AIRPORT

DATA PACKAGE NO. 2.

AIRPORT IMPROVEMENT
TASK FORCE DELAY STUDIES.

DTIC ELECTE
JUN 0 9 1981

E

TOTAL PROPERTY OF THE PROPERTY OF

DING FILE COPY.

JANUARY 1979

DISTRIBUTION STATEMENT A

Approved for public release;
Distribution Unlimited

81 6 08 138

411863

DEPARTMENT OF TRANSPORTATIONFEDERAL AVIATION ADMINISTRATION

DATE: January 5, 1979

NATIONAL AVIATION FACILITIES EXPERIMENTAL CENTER

IN REPLY ANA-220

ATLANTIC CITY, NEW JERSEY 08405

SUBJECT: Miami Simulation Model Calibration Results and Input Data Summary for Stage 1 Experiments

FROM: NAFEC Program Manager, ANA-220

το: Ray Fowler, AEM-100

Enclosed are data packages for use during the third Task Force meeting on January 24, 1979.

. Attachment A presents the results of the Simulation Model Calibration.

. Attachment B contains the model input data for Configurations A and B.

. Attachment C contains the model input summary for the Miami Stage 1 Experiments.

. Attachment D contains a table of the Miami Stage 2 Experiments.

These attachments should be reviewed, revised, and approved by the Miami Task Force prior to use in the model runs.

JOHN R. VANDERVEER

Enclosures

Table of Contents

Item	Description	Page
1	Attachment A - Simulation Model Calibration Output	A-1
2	Attachment B - Configurations A and B Model Input Data and Airline Group Categories	B-1
3	Attachment C - Model Input Summaries for Stage 1 Experiments	C-1
4	Attachment D - Miami Stage 2 Delay Experiments	D-1

Accession For
NTIS GRA&I
DTIC TAB Unannounced
Justification
Bv
Distribution/
Aveste of the Codes
Dist Common)
Dist Common A

LIST OF ILLUSTRATIONS

Figure		Page
1	Miami Arrival Flow Rate	A-3
2	Miami Departure Flow Rate	A-4
3	Miami Arrival Delay	A-5
4	Miami Arrival Travel Times	A-6
5	Miami Departure Travel Times	A-7
6	Miami Easterly Configuration	B-3
7	Miami Westerly Configuration	B-12
8	Miami Link-Node Diagram	B-17
9	Easterly Configuration Improvement Worksheet	C-29
10	Westerly Configuration Improvement Worksheet	C-56

LIST OF TABLES

Table		Page
1	Hourly Comparison of Output Data for Simulation Model Calibration	A-2
2	Miami Delay Experiments - Stage 1	C-2
3	Arrival and Departure Runway/Gate Distributions	C-6
4	Arrival Fix/Runway Distributions	C-18
5	Arrival Aircraft Lateness Distribution	C-22
6	Pre-1985 VFR Separation Values	C-27
7	1978 IFR Separation Values	C-34
8	Pre-1985 IFR Separation Values	C-44
9	Miami Delay Experiments - Stage 2	D-2

ATTACHMENT A

SIMULATION MODEL CALIBRATION OUTPUT DATA

- A. FLOW RATES
- B. DELAYS
- C. TRAVEL TIMES

SEE HOURLY SUMMARY (TABLE 1) AND

QUARTER HOUR FIGURES 1 TO 5

Miami International Airport

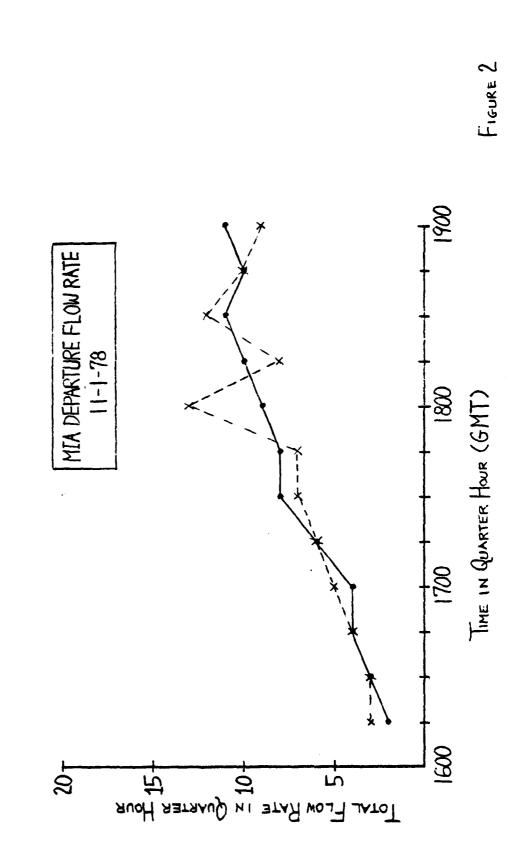
Miami Airport Improvement Task Force Delay Studies

January 1979

Table 1
Hourly Comparison of Output Data for Simulation Model Calibtation

Time(Gmt)	Arrival Flow Rate Data/Model (S.D.)	Departure Flow Rate Data/Model (S.D.)
1600-1700 1700-1800 1800-1900	43 44 (0.74) 45 47 (0.74) 25 23 (0.00)	13 14 (0.42) 31 32 (0.42) 42 39 (0.00)
Time (Gmt)	Average Arrival Air Delay(min) Data/Model (S.D.)	Average Fix to Threshold Travel Time (min) Data/Model (S.D.)
1600-1700 1700-1800 1800-1900	1.97 0.90 (0.11) 2.29 2.20 (0.39) 1.55 0.20 (0.02)	12.56 9.33 (0.11) 11.96 11.90 (0.40) 11.24 10.13 (0.02)
. Time (Gmt)	Average Arrival Threshold to Gate Travel Time (min) Data/Model (S.D.)	
1600-1700 1700-1800 1800-1900	2.43 3.10 (0.06) 3.13 3.09 (0.09) 2.92 2.80 (0.08)	

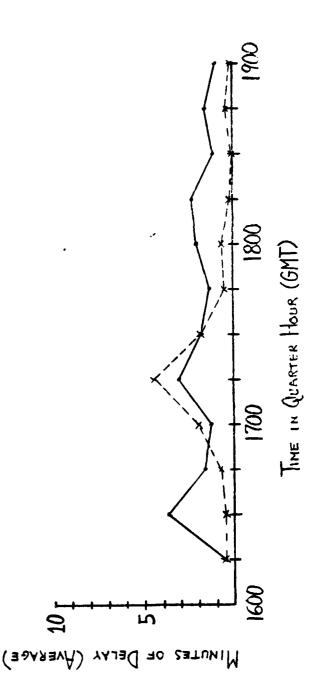
X - X MOBEL

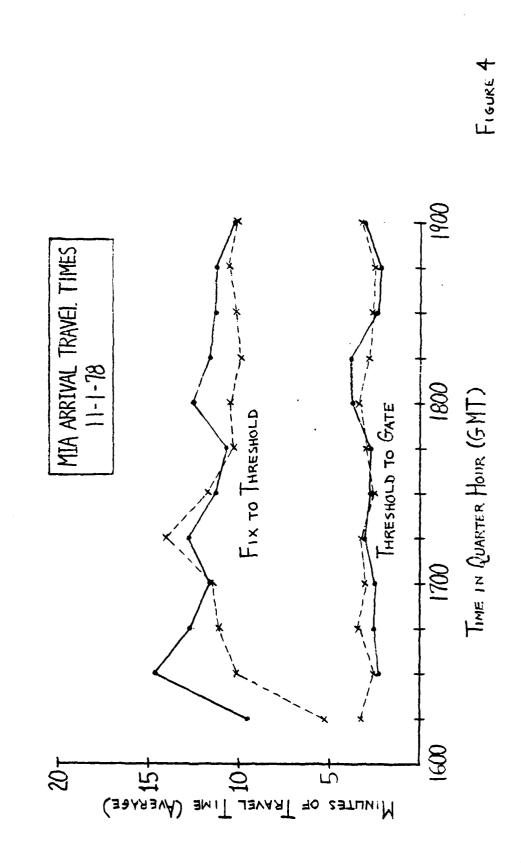


UATA

* 1 *

MIA ARRIVAL DELAY

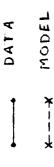




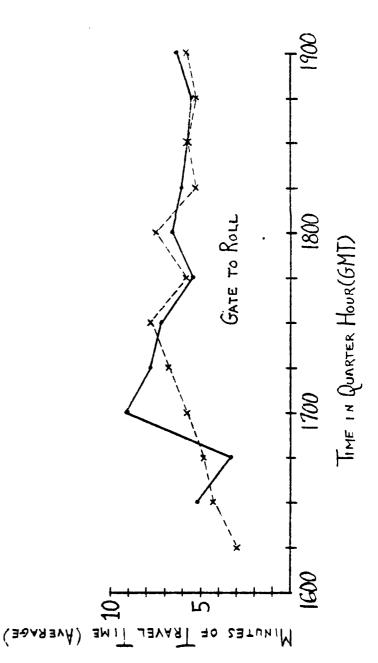
MODEL

*---

DATA



MIA DEPARTURE TRAVEL TIME 11-1-78



ATTACHMENT B

Configurations A and B Model Input Data

Miami International Airport

Miami Airport Improvement Task Force Delay Studies

January 1979

Miami Airport Configuration

There are two basic configurations (for the airport) selected for study by the Miami Task Force. All the experiments considered in the technical plan can be performed using one of the following configurations. The variation of the input (such as runway assignments for arrivals and departures) can control the experiment to reflect the desired conditions of the test.

The two configurations are:

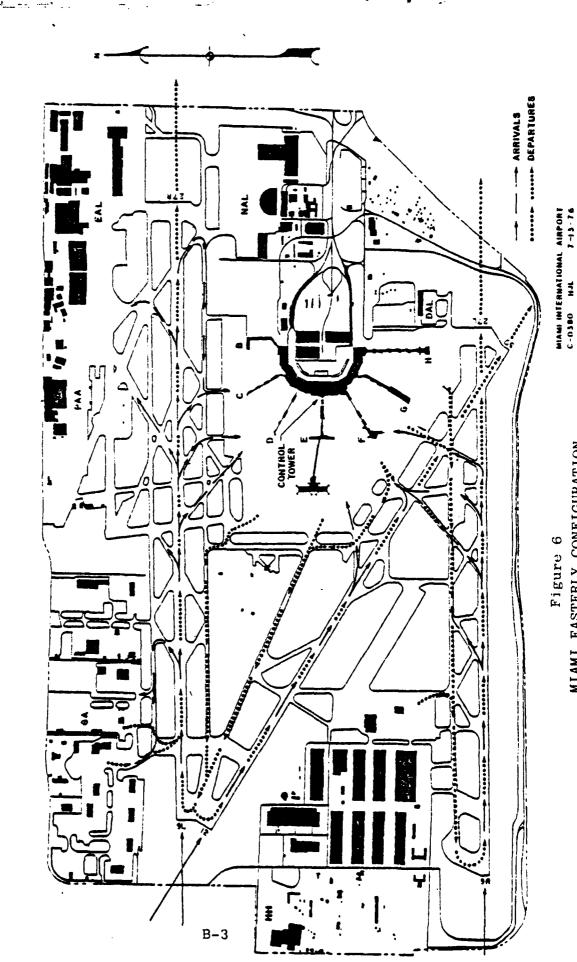
A. EASTERLY CONFIGURATION (See figure 6)

RUNWAYS	MODEL RUNWAY NO.
9R	1
9L	2
12	3

B. WESTERLY CONFIGURATION (See figure 7)

RUNWAYS	MODEL RUNWAY NO.
27R	1.
27L	2
30	3

The link-node diagram for the airport required to develop the route structure for each configuration is shown in figure 8.



MIAMI EASTERLY CONFIGURATION Figure 6

INPUTDATA

MIAMI INTERNATIONAL AIRPORT AIRFIELD SIMULATION MODEL CALIBRATION RUN	1-1-78	
NUMBER OF RANDOM NUMBER SEEDS		
PANDOM NUMBER SEEUS 2017 3069 4235 5873 6981 7137 8099 9355	123 1985	
START TIME AND FINISH TIME 164 0 198 5		
PRINT OPTIONS		
NUMBER OF AIRLINES		
AIRLINE CODES 1A EA DO FF GG HH C1 C2 F1 F3 GA	F2	
NUMBER OF RUNWAYS		
RUNNAY NAMES 9R 9L 12		
RUNNAY END LINK NUMBERS		
RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVA		
RUNWAY ARRIVAL ON R/W 2 47. 43. 421 46.		
RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL 2 51. 49. 46. 50. 47. 47. 42. 42. 20. 20. 20		
XMG LINK RUNMAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL 259 2 51. 49, 46, 50, 474, 47, 42, 42, 20, 20, 20, 20, xmg i mm plinmay arrival on R/W departure on D/W AUDIVAL ON FINAL		!
3 47 43 42 46 474 47 42 42 20 20 20 20 80 MMAY ARRIVAL ON R/W DEPAKTURE ON R/W ARRIVAL ON		
421 46. 47. 47. 42. 42. 20. 20		
ARRIVAL ON R/W 47. 43. 421 461		
XNG LINK RUNWAY ARRIVAL ON R/W DEPAKTURE ON R/W AHRIVAL ON FINAL 282 3 47. 43. 42. 46. 47. 47. 42. 42. 20. 20. 20. 20.		

:

:

:

KUNNAT CKOSSING TIME AND INTERAKKIVAL GAP	
227 1.50 1.00	
1.50	
1.50 1.00	
1.00	
1.50 1.00	
1.50	#
1.50 1.00	
4.00	
282 1.50 1.00 1.50	
NUMBER OF EXITS	
1	
IN FEET FROM THRESHOLD TO THE EXIT TAXIWAY (EXIT LINK NO.	
319 3630.0 302	
5769.0 290 5992.0 273 6140.0 272 6650.0 293	
6980.0 266 6649.0 282 7589.0 121 7590.0 298	
100	
HULDING AREA NUMBERS 99	
G NUMBER OF G/A BASING AREAS	
G/A BASING AREA NUMBERS	
61	
The second secon	

		LENGTHS OF COMMON APPROACH FATHS FROM OUTER MARKER TO THRESHOLD IN NAUTICAL MILES (RUNWAY NO., A/C CLASS, LENGTH) 1	LIMITS LIMIT = 3100 LIMIT = 3100 LIMIT = 300 LIMIT = 300 MEUE LENGTH AND INTERARRIVAL GAP MEAN = 2.00 STD DEV = 0.000									>	MARKER TO THRESHOLD IN NAUTICAL MILES (RUNWAY	C2 3 6 6 7 4 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
--	--	--	---	--	--	--	--	--	--	--	--	-------------	---	--

MO-WAY PATHS											
	108	350	109	110	353	112	351 113				
	117	352 350	116	115	114	113	351 112				
!	265	357			 	i :		-		4	
1	358	566			:		;	;			#
	191	192	193	194	561	196	363		• !		
i	195	194	193	192	161	190	382	;			***
	265		. !		;	:			i	!	
	266										
	200	201	202	203	204	300	205 206	1	,		
1	208 199	207	206	205	380	504	203 202				
	174	354	175	176	171	386	527				
1	111	176	175	354	174	173	356				
į	213	376				!					
i	115	114	113	351	112	ııı	110 109				
	357				!						
	279		-								
	361					-		:			
{	279				:	!					•
	137	371									
i	136	369				!		: :			
1	129	130	131	364					i i		
	130	129	128	362							
	152	151					ī				
1	153	372					:	•	:	f	
1	212	377				:					
į	!				: : : :					1	***

HE 16 SETS ARE PO HERE ARE 4 A/C CL	ASSES	0	AUV						:	!
		8	CLASS CLASS	: •						
BRUER BF SETS) (X•X) JO	4) A CLI	ASS							
3,2), (1	3) (1.4	(2.1)	(2.2), (4.2), ((2.3), ((4.3), ((8.4)					
RUNMAY	LEAD	A/6 F		A I L	V.C RUNHAN	Ĭ.	_	0		
EPARATION	UES IN 4	ETS OF	32. A/A	_1	ES), 0/A	£S) •	D/D (MINUTES)	AND AZD (MINUTES)		
4.10 ./0 7.30 .70	4 1 90 0 0 0 0		0.0 0.0	9 6	5.60 8.60	n n n	11/11			
30	3.20	. 65	3.10	. 09	3.00	. 55	11/17			
.30	3.20	• 65	3.10	09.	•	55				
.89 .84	1.76	2. ×.	1.63	5.54	1.63	***	•	,		
:	1454	-24		.23	•			+ X-5 4		
	-	.24	1.41	623	•	.23	•			
1	•	0	2,40	90.	•	80.		,		
80. 04.	•	90	1.23	90.	•	.08		1.2 C		
•	٠.	800	8	80	30°	80.	7/6	•		
50.	115	-	60	89.6	36.	200				
: 7	- r	6		23	7.		0/10			
98		-	. 61	. 23		60.				
8	.78	19.				60.				
A/C RUNNAY SEPABATION VA	EAD	A/C FIX	0 4/4	TRAIL A	C PUNWA	3	TRAIL A/C FIX	O AND		
.35 .70	9,13	.65	S.	09	5.73	.55				
.55	4	59.	7	09	3.99	.55	1			
3,55 .70	3143	.65	3,31	09.	3.19	.55				
•	3143	.65	3.31	. •	3.17	•55				
•	1.76	. 25	1.63	.24	1.63	+54				
. 68	1.76	.55	•	• 54		•54				
•	1.54	-24	•	•23	•	•23		:		
.65	1.54	• 24 • 24	1.41	.23	1.41	£2:				
:	07.7	9 6	2.40	3 e	•	80.	****			
• () () () () () () () () () () (.	• •	800	• •	. X				
.23	1115	80.	96	90	96.	30.			1	
-	.78	.19	16.	.23	.74	.0.				
•	.78	. 19	16.	.~	*1.	60.		:	:	
.88	• 78	61.	10	~		0 0				
		٠		3	*	60.				

:

; ; .

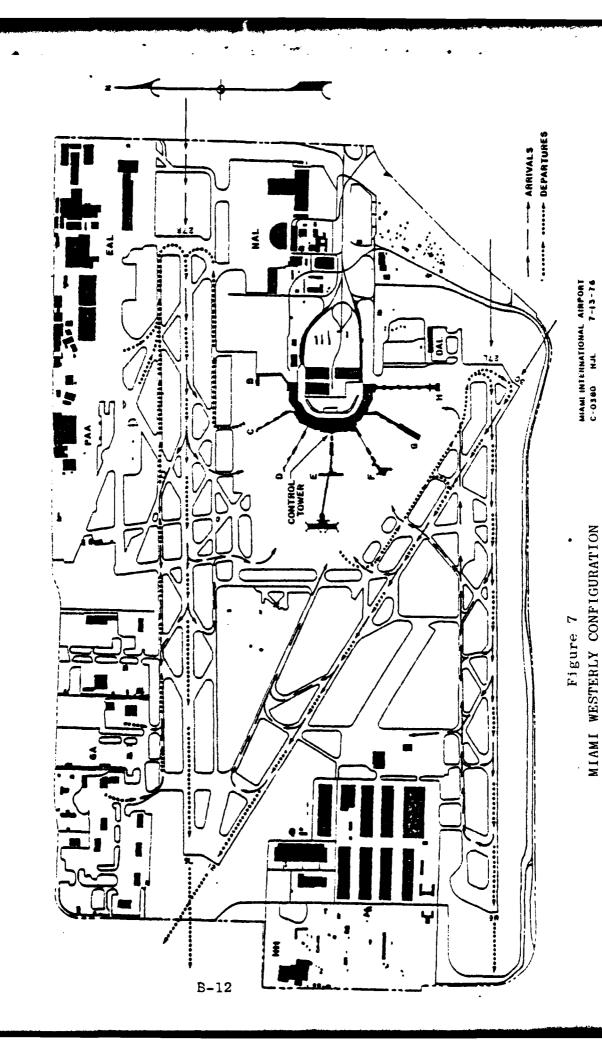
:

:

4.35				2	C3776.W1	• 1			AND A/O (MINUTES)	
U	•	7	, e	٠.	99.	•	ស ស ស ស			
N	•	*		٦,	00.	•	30.	•		
n u	٠.	•	0.4	7:	9	•	ก ก			
00.	2 3	* ^	20.	? 4	00.		50°			
3 4		•	3	9 4	1 0	•	***			
`		• 4	4	9 4		•	יי			
•	. ~	1,54	24	14.	53.	14-1				
•		7 4	40	. 4	90	•		•		
		1 4	80	. ~						
	•		80	9	0.0	•				
· ~		•	60	•	80.		80			
1 2	•		0	٠, ٦	5					
a	• -	٠,		٠ ٥	15					
9 4	•	2 4	01		5	1		:	1	1
6		9.7	61.	76	23	7.	60		:	
		•						A CANADA AND AND AND AND AND AND AND AND AN	·	
A/C RUN	MAY 2	LEA LEA	A/C F1	, 0 ° 5	TRAIL A	C RUNWA	60	0		
¥	Š	27 67	ב על	200	7.8.LE	4/0 e/	ى ⊸	(MINUIES) AND A/D	(MINULES)	
200	٠.	-	•	•	9	•	ה ה ה			
വ	• •	•	9 4	•	2 4	•	0 u			
1 u	• •	•	D 4	י נ	3 4	•	ט מ	1		
ne	•	700	•	7 6	•	•	000			
>	•	? ?	? <	? <	? ?	•	> c			
,	•	? ?	•	•	•	? <	3 0			
•	9	•	0	20	, .					
- 0	9	•	9	•	9					
. 0	•	0	٩.	?			9			
0	00.	9	٠,	•	•	•	•			
0	•	9	•	•	•	•	0			
0	•	•	٠,	•	•	•	•		•	
•	•	•	٩,	9	3	•	•			
0	٩.	•	٩	٩.	٦,	•	•			
.00	٠.	0	•	•	•	•	•		,	
•	NAY 3	I FAD	A/C F	0 *	A 11 A	C RUNWAY	, ~	TRAIL A/C FIX 0	!	
EPARATI	ON KA	Z	SE 1 S	32,	MILE	2	ż	(MINUTES) AND A/D	(MINUTES)	
3	-	-	•	5.9	90	5.73	.55			
S	~	4	.65	₹	ø	•	.55			
. 55	_	\$	• 65	۳,	O	•	• 55			
S	•	4	•	٣,	ø	•	55			
•	0.0	00.0	00.0	00.0	00.0	000	00.0			
> (•	•	•	? '	÷ ,	9	•			
ə :	? 4	•	? (•	•	0.0			
> <	•	9 9	•	•	•	•	•			
> :	•	? 9	•	•	•	•	•			•
> <	•	•	; <	•	•			1	f	1
•	•	3 <	•	•	•	•	•			
> <	•	? '	•	•	•	•			:	
> <	•	= 9	•	•	•	٠	•			
> <	•	9 9	•	•	• ·	•	•			
	•	•	?	?	•	٠	5			
4	٠	•	•	•	•	•	•			

	VECTORING DELAY INPUTS Fix delay Evaluation Level	MOLDING PCT.	MAKINUH VECTORING DELAY	CH MINISTER	DEI AV		
4.100 4.100	1 4:00	100.00	000				
OF OUEUE SAITCH FOR NUMARY 2 = 99 OF OUEUE SAITCH FOR NUMARY 3 = 99 OF OUE OUEUE SAITCH FOR NUMARY 3 = 99 OF	0014	00.004		200.2) 		
007 OUEUE SAITCH FOR ROWARY 2 = 99 OFT OUEUE SAITCH FOR ROWARY 5 = 0 OFT OUE SAITCH FOR ROWARY 5 = 0 OFT OUEUE SAITCH FOR ROWARY 5 = 0 OFT OUEUE SAITCH FOR ROWARY 5 = 0 OFT OUE SAITCH	0017	100.00	• •	2.00			
00F QUEUE SATICH FOR RUNAAY 1 = 99 OFF QUEUE SATICH FOR RUNAAY 2 = 99 OFF QUEUE SATICH FOR RUNAAY 2 = 99 OFF QUEUE SATICH FOR RUNAAY 2 = 99 OFF QUEUE SATICH FOR RUNAAY 4 = 0 OFF QUEUE SATICH FOR RUNAAY 5 = 0 HOLD LIMIT = 5 HOLD THE = 4.00 OFF QUEUE FEREFARY OF THE IN SECONOS (A/C CLASS, HEAN, AND STD. DEV.) SERVICE THE DISTRIBUTION (PROBAALLITY YS TIME) A 30.00 A 0.00 A	00:4			2.00			
OUCUE SWITCH FOR RUNHAY 2 = 99 OUCUE SWITCH FOR RUNHAY 2 = 99 OUCUE SWITCH FOR RUNHAY 4 = 0 OUCUE SWITCH FOR RUNHAY 4 = 0 OUCUE SWITCH FOR RUNHAY 4 = 0 OUCUE SWITCH FOR RUNHAY 5 = 0 OLINIT = 5 HOLD THE = 4.00 OLINIT = 4		100.60	• •	2.00	i i		
OFF OUEUE SWITCH FOR RUNNAY 2 = 99 OFF OUEUE SWITCH FOR RUNNAY 4 = 0 OFF OUEUE SWITCH FOR RUNNAY 4 = 0 OFF OUEUE SWITCH FOR RUNNAY 4 = 0 OFF OUEUE SWITCH FOR RUNNAY 5 = 0 HOLD LIMIT = 5 HOLD TIME = 4.00 HOLD LIMIT = 4.00 HOLD LIMIT = 5 HOLD TIME = 4.00 HOLD LIMIT = 4.00 HOLD LIMIT = 5 HOLD TIME = 4.00 HOLD LIMIT = 4.00	QUEUE	n					
OFF DUEUE SWITCH FOR RUNNAY 1 = 0 OFF DUEUE SWITCH FOR RUNNAY 4 = 0 OFF DUEUE SWITCH FOR RUNNAY 4 = 0 OFF DUEUE SWITCH FOR RUNNAY 5 = 0 HOLD LIMIT = 5 HOLD TIME = 4.00 HOLD LIMIT = 4.00 HOLD L	OUEUE SHITCH FOR	~					
OFF DUEUE SWITCH FOR RUNNAY 4 = 0 HOLD LIMIT = 5 HOLD TIME = 4.00 HOLD LIMIT = 4.0	QUEUE SWITCH FOR	3 * 99			•	•	
HOLD LIMIT = 5 HOLD TIME = 4.00 HOLD LIMIT = 5 HOLD TIME = 4.00 1 9.00	QUEUE SWITCH FOR						
HOLD LIMIT = 5 HOLD TIME = 4.00 HOLD LIMIT = 5 HOLD TIME = 4.00 HOLD LIMIT = 5 HOLD TIME = 4.00 ACCURENCE PERFENTACE HOLD FERN HOLD SIGNA OCCURENCE PERFENTACE HOLD FERN HOLD SIGNA DEAR TUBE RENANY OCCUPANCY TIME IN SECONOS (A/C CLASS, HEAN, AND STD. DEV.) 2 30.00 2 3 30.00 3 0.00 3 0.00 5 0.00 5 0.00 5 0.00 5 0.00 5 0.00 5 0.00 5 0.00 6 0.00 7 0.00	QUEUE SWITCH FOR	H •5		•			
HOLD LIMIT = 5 HOLD THE # 4.00 ACC DELAYS OCCURENCE PERCENTAGE HOLD HEAN HOLD SIGHA PEPARURE HENNAY OCCUPANCY TIME IN SECONDS (A/C CLASS, HEAN, AND STD. DEV.) 2 93.00 4 34.00 4 34.00 4 34.00 6 0.00 6 0.00 7 0.00 9 0.00 1 0.00 9 0.00 2 8ERVICE TIME DISTRIBUTION (PROBAULLITY YS TIME) 5 0.00 6 0.00 7 0.00 8 0.00 9 0.00 9 0.00 1 0.00 9 0.00 9 0.00 1 0.00 9 0.00 1 0.00 9 0.00 1 0.00 9 0.00 1 0.00 9 0.00 1 0.00 9 0.00 1 0.00 9 0.00 1 0.00 1 0.00 1 0.00 1 0.00 1 0.00 2 0.00 2 0.00 2 0.00 3 0.00 4 0.00 5 0.00 1 0.00 9 0.00 1 0.00 9 0.0	HOLD LIMIT . 5 HOLD	00**		:			
ACC DELAYS OCCURENCE PERCENTAGE HOLD HEAN HOLD SIGNA OCCURENCE RENEENTAGE HOLD HEAN HOLD SIGNA OCCURENCE RENEENTAGE HOLD HEAN HOLD SIGNA 1 30.00 4.00 2 30.00 4.00 2 4.00 1 0.00 2 0.00 2 0.00 3 0.00 3 0.00 4 0.00 5 0.00 5 0.00 5 0.00 6 0.00 7 0.00 8 0.00 9 0.00 9 0.00 1 0.00 1 0.00 2 0.00 3 0.00 3 0.00 4 0.00 5 0.00 6 0.00 7 0.00 8 0.00 9 0.00 9 0.00 1 0.00 9 0.00 1 0.00 1 0.00 1 0.00 2 0.00 3 0.00 3 0.00 4 0.00 5 0.00 5 0.00 6 0.00 7 0.00 8 0.00 8 0.00 9 0.0	HOLD LIMIT . 5 HOLD						
SPACE DELAYS OCCURENCE PERCENTAGE HOLD HEAN HOLD SIGMA DEPARTINE RUNNAY OCCUPANCY TIME IN SECONDS (A/C CLASS HEAN AND STD. DEV.) 2 39.00 4 34.00 5 34.00 6 4.00 6 4.00 6 4.00 7 3 0.00 7 0.00 8 0.00 9 0.00 9 0.00 9 0.00 10 0	HOLD LIMIT . 5 HOLD						
PARTURE KUNNAY OCCUPANCY TIME IN SECONDS (A/C CLASS, MEAN, AND STD, DEV.) 1 39.00 4.00 2 34.00 4.00 4 34.00 4.00 1 0.00 0.00 2 0.00 0.00 3 0.00 0.00 4 0.00 0.00 4 0.00 0.00 5 0.00 0.00 6 0.00 6 0.00 7 0.00 8 0.00 9 0.00 9 0.00 1 0.00 1 0.00 1 0.00 2 0.00 3 0.00 4 0.00 5 0.00 6 0.00 7 0.00 8 0.00 9 0.00 1 0.00 1 0.00 2 0.00 2 0.00 3 0.00 4 0.00 5 0.00 6 0.00 7 0.00 8 0.00 9 0	SPACE DELAYS OCCURENCE PERCENTAGE	HOLD MEAN HOLD					
4 34.00 4 34.00 4 1.00 4 0.00 1 0.00 2 0.00 2 0.00 3 0.00 6 0.00 4 0.00 6 0.00 6 0.00 7 0.00 9 0.00	/C DEPARTURE RUNMAY 1 39.00 4 2 29.00 4	TIME IN SECONDS (A/C	• HEAN• AND STD				
AND-60 RUNMAY OCCUBANEY TIME IN SECONDS (A/C CLASS, MEAN, AND STD, DEV.) 2 0.00 0.00 4 0.00 4 0.00 6 0.00 2 0.00 1 0.00 3 0.00 9 0.00 1 1.00 2 0.00 9 0.00 9 0.00 2 0.00 2 0.00 2 0.00 3 0.00 2 0.00 3 0.00 3 0.00 5 0.00	34.00						
ERVICE TIME DISTRIBUTION (PROBABILITY VS TIME) 2 2 4 00 3 4 00 4 4 00 4 1 140.00 5.00 2 130.00 5.00 3 120.00 5.00	AND-60 RUNMAY 1 0.00 2 0.00 3 0.00	TIME IN SECONDS (A/C	• MEAN. AND STD	0Ev.)			
100 100 100 100 100 100 100 100	ERVICE TIME	(PROBABILITY VS			1		
3 •00 • • • • • • • • • • • • • • • • • • •	0.00 0.00 0.00			ī	:	;	
APPROACH SPEED IN KNOTS (A/C CLASS, MEAN, STD, DEV 1 140.00 5.00 2 130.00 5.00 3 120.00 5.00	CLASS 3 0.00 CLASS 4 0.00						
120.00	APPROACH SPEED IN KNOTS	CLASS, MEAN, STD.	[ΕV•.]	i			
40° 00°			+			:	

6140.0 52.00 6649.0 48.00 6052.0 58.00 9200.0 76.00 4799.0 35.00 4972.0 40.00 52.00 6980.0 60.00 7589.0 60.00 4400.0 55.00 4972.0 46.00



									•	
	,								-	
		•								
MIAMI COM	MIANI CON- IGUHATION 'B'	ë								
RIN NAMES										
1 27H	27L	30								1
RINT END LINKS	INKS									
422	401	413				.•				1
RAW XING LINKS	-INKS									
1	227									
:	228									
	258									
	529									
B	267	Cle	Clearance Times		for Ru	nway C	rossinį	s to be	for Runway Crossing to be Completed.	
;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;	566									•
	121									
, m	280									
; n	282									
RWY EXIT	RWY EXIT SELECTION		,							:
		\$								
287	0.10	302	0.50	329	0:50	255	0.50			
2		9								
06?	0.02	259	0.04	287	0.28	302	0.55	59 ₆	0.02	: 1
329	0.08									
8		. •								
962	9.05	300	0.24	290	0.24	259	0.15	287	01.0	
302	0.24									
	-	8								
590	0.50	302	0.50							
	%	8								· · · · · · · · · · · · · · · · · · ·
		,							•	

		3	1010								
	N.	r)	,				İ	- (
Ö	0.30	316	0.30	321	0.40						
-	8	n								-	
270 0.	0.30	316	0.30	321	04.0			,			
*	2	n	 								
270 0,	0.30	316	0.30	321	0+0						
	3	2	!								
307 0.	0.68	305	0.21	304	0.11			<u> </u>			
~	n	S									
266 0	0.05	323	0.03	284	60.0	307	0.72	305	0.11	i unique artiminata de que mentalque de la comunidad de la com	
B	9	æ	<u> </u>	<u> </u>		· ! ·	! ! !				
266 0.	0.30	281	0.10	307	0.20	304	04.0				
-	n	=	<u> </u>			: !					
266 0	0.30	284	0.10	307	0.20	304	0+•0				
EXIT DISTANCES	ANCES										
18					1			,			
287 5	5480	302	6230	329	0777	255	9220	290	4460		
259 4	4720	296	1160	298	2400	300	3390	321	6880	. · · · · · · · · · · · · · · · · · · ·	
316 4	4950	270	4250	307	5830	305	6880	304	8260	radica de la majo decambandamento e administratorio. El cultura del cultura como del compositorio del como del	
266 2	2920	323	3800	284	4770	1	:		:	remainer i cadamantaman estado de la como de destado de la como de destado de la como de destado de la como de	
FIX TRAVEL TI	TIMES			 	!	!		;	,		
1	1	-	28.5	180.0		1	i		1		
!	1	2	28.5	180.0		•				nance emission families - in money and metadeliameliame in a contra equal mate	· · · · · · · · · · · · · · · · · · ·
1	1	n	28.5	180.0							
-		*	1		,						
2	-	-	1	:							<u> </u>

-		<u>.</u>		۹			•		•				•		٠,	-				•		•		-			•			
		-												i !					:			.								i
:																					•									
<u> </u>																														
	-												!	1 : : : : : : : : : : : : : : : : : : :		[
-		;		i	i : :	-					!				:	:							1					:		
	:	;			: : : :			1						:	:					•			:		•					
									:									:	ı		i i	!		ļ			! :		•	
						!				i	:					į		:	;		•						i i		!	•
	•							!	:			i -			ŧ	· •	•	i i	!	•	•			:	:	; !	1			
			180.0	1		180.0		.]	, l	180.0	180.0	·]	1		180.0	!	ĺ	180.0	180.0	,	1	1	180.0	.	1	180.0		-	1	
			25.5	1		28.5	1		-	30.0	30.0		1		28		İ	28.5	28.5	1		1				31.5		1		
			~		*	İ	1	m	#		8	6	#	-	2	M	.	1	8	R		1		5	į	1		n	*	
	·		-	1	1	-	7	7	1		-	1	1	8	2	2	2	2	7	2	7	2	8	2	7	8	2	2	8	
			~	~	8	3	8	8	2	3	*	\$	3	-	1	1	1	8	8	~	2	n	•	n		*	*	-	*	
														B-1	!													:		
	į	•	1	ì	1	}	ļ		ì	1	,	!	!	1	1	j	ļ	ł	1	1	i	,	i	i	i	1	1		Ì	

										The state of the s		i		Commence of the commence of th											
		 	.0 202.5	1	180.0	1	:				1					-									•
	-		1 27.0	2 27.0	5 27.0		1 31.5		}			2 28.5	3	3											į
			-	3	80	13	2	2	n	n		3		2											
			~		8	4	-	-	n	2	7	=	-	+											
															B-	16		The state of the s		:				And the second second	

FIGURE 8 - MIAMI LINK-NODE DIAGRAM

AIRLINE GROUP CATEGORIES

Airlines have been coded into 12 groups for model input:

Airline Code	Category
IA	International Airlines (Concourse E and Satellite
EA	Domestic Airlines (Concourses B and C)
DD	Domestic Airlines (Concourse D)
FF	Domestic Airlines (Concourse F)
GG	Domestic Airlines (Concourse G)
HH	Domestic Airlines (Concourse H)
C1	Air Taxi (Concourse D)
C2	Air Taxi (Concourse H)
F1	Cargo (N.W. Area)
F2	Cargo (Rich Area)
F3	Cargo (Airlift Area)
GA	General Aviation

The airlines included in each of the above groups are:

1) International Airlines (IA)

AF - Air France

AM - Air Mexico

AR - Argentinas

AV - Avianca

BA - British Airways

BN - Braniff (DCS's)

BW - British (West Indian)

ST - Belize

DO - Dominicana

EU - Ecuatoriana (Also EQ)

GU - Aviateca

IB - Iberia

JF - L. A. B. Flying Service, Inc.

JM - Air Jamaica

KQ - Cayman Air (Also KX)

LA - Lan Chile (Also LN)

LM - Alm Dutch (Antillian)

LR - Lacsa

MX - Mexicana

NI - Lanica

OD - Aero Condor

International Airlines (IA) Continued

OP - Air Panama

PA - Pan American (Clipper)

PL - Aero Peru (Peruvian)

TA - Taca

TX - Honduras (Also TAN)

VA - Viasa

RG - Varig

2) Domestic Airlines (EA)

EA - Eastern

3) Domestic Airlines (DD)

BN - Braniff (727's)

WA - Western Airlines

4) Domestic Airlines (FF)

NA - National

NC - North Central

5) Domestic Airlines (GG)

AC - Air Canada

OZ - Ozark

CO - Continental

SO - Southern

NW - (Northwest) Orient

AA - American

TW - Trans World Airlines

UA - United

6) Domestic Airlines (HH)

DL - Delta

BH - Bahamas Air

7) Air Taxi (C1)

MCS - Marco Island Airways

AAT - Air Sunshine (AMAIR)

PLM - Air Florida (PALM)

PT - Naples

8) Air Taxi (C2)

FDA - Florida Air Lines

XW - Shawnee ORA - Ocean Reef

VW - Air Miami

9) Cargo (F1)

CC - Aerocosta

CF - Fawcett

CJ - Carib West

HJ - Air Haiti AESA - El Salvador

KS - Saturn Airways

MM - Columbia(Also SAM)

SJ - Southern Air Transport

TD - Trans Carga

10) <u>Cargo (F2)</u>

IX - Panama (INAIR)

RI - (RICH) International (Also RIA)

FDE - Federal Express

FLM - Fleming

11) Cargo (F3)

ED - Andes

AER - Argentina

TAR - Argentina

RD - (Airlift) International

FT - Flying Tiger

12) General Aviation

GA - All G. A. Aircraft

Attachment C

INPUT DATA SUMMARY STAGE 1 EXPERIMENTS

Miami International Airport

Miami Airport Improvement Task Force Delay Studies

January 1979

TABLE 2
MIANI DELAY EXPERIMENTS
STAGE ?

Near-term Improvements	None None 1985 Pre-1985 , 50% Less G.A.9	Mone None None None Pre-1985	None None None None Pre-1985	Mone Pre-1985 Pre-1985, 50% Less G.A. ⁹
ATC System Scenario	Todays Todays Pre-1985 Pre-1985	Todays Todays Todays Todays Pre-1985	Todays Todays Todays Todays Pre-1985	Todays Pre-1985 Pre-1985
Demand	Todays Pre:1965 Pre-1985 Pre:1985	Todays Todays Pre-1985 Pre-1985 Pre-1985	Todays Pre-1985 Todays Pre-1985 Pre-1985	Todays Pre-1985 Pre-1985
Weather	VFR1 VFR1 VFR1	16R1 1FR2 1FR2 1FR2	VFR1 VFR2 VFR2 VFR2	IFRI IFRI IFRI
Departure Runways	91, 98, 12 91, 98, 12 91, 98, 12 91, 98, 12	94, 98, 12 91, 98, 12 91, 98, 12	271, 278, 30 271, 278, 30 271, 278, 30 271, 278, 30 271, 278, 30	21. 27R 21. 27R 27L, 27R
Arrival Runmays	98, 12 94, 98, 12 94, 98, 12	91, 98 None 91, 98 None 91, 98	271, 278, 30 271, 278, 30 271, 278 271, 278 271, 278	271, 278 271, 278 271, 278
Study		₹\$\$ ₹\$\$\$\$	~~~~	50.00.00
Node]	P	45 45 45 45 br>45 45 45 45 45 45 45 45 45 45 45 4	A 54 A 54 A 54 A 54 A 54 A 54 A 54 A 54	ASH ASH ASH
Experiment Number	==	4000	2 8 3 17 12	15 20

Study cases are defined in Figure III-1 of the Miami International Airport Technical Plan (Oct. 1978).

brad will describe impact of pre-1965 and post-1985 AIC systems on model inputs (as per report No. FAA-EM-78-RA).

Spotential near-term improvements are identified in Appendix B of the Miami International Airpurt Jechnical Plan.

Airfield Simulation Model

Flask force will establish packages of near-term improvements most likely to be implemented in the pre-1985 and post-1985 time frames. Improvements to runmays 91/27R, 94/27L, and 12/30 identified as improvements 1, 2, and 3 in Appendix B of the Technical Plan are most likely to be included in the pre-1985 improvements.

Reduction in general aylation achieved by upgrading Opa Locka and Tamioni General Aviation Reliever Airports.

MIA INDEX OF STAGE 1 EXPERIMENTS*

Page	C-4	C-25	C-30	C-32	C-36	C-38	C-40	C-42	C-46	C-48	C-50	C-52	C-54	C-57	C-59	C-61
Type of Input Description	Change-Sheet	Change-Sheet Change-Sheet	Change-Sheet													
Mode 1	ASM	ASM ASM	ASM	ASM	ASM	ASM	VSW	ASM								
Study Case No.		- -		4	œ	ታ	œ	G	ଷ	2	က	ന	7	വ	ည	ಬ
Experiment No.	₩ (11	14	4	9	G	10	21	7	∞	က	17	12	5	15	20
Sequence No.	 (N (n	4	2	9	2	80	6	10	11	12	13	14	15	16	17

Stage 1 experiments as revised by the Miami Delay Studies' Task Force on 12/8/78, but reorganized and grouped by similar runway configuration/weather categories.

EXPERIMENT NO. 1

Objective:

To obtain baseline delay estimates for the following runway configuration in VFR1 for 1978 demand:

Arrival Runways

Departure Runways

9L, 9R, 12

9L, 9R, 12

Related Comparison Experiments:

Calibration was performed using this easterly configuration. Inputs should be similar, but with 1978 demand. Experiment 4 examines this configuration with IFR1 weather and 1978 demand. Experiment 7 compares to this baseline case, wherein demand is increased to the 1983 level under VFR1 conditions.

- . Time period to be simulated.
- . 1978 demand.
- . 1978 demand input distributions (arrival fix, runways, gates). (see tables 3 and 4)
- . Lateness distribution (see table 5).

Experiment Number: 1 (Input changes from experiment number Config. "A")

SI	MULATION MODEL INPUT	DESCRIPTION OF INPUT CHANGE
A. Lo	aintin.	on the state of th
	gistics	Miami Dolou Europinanta Gi
<u> </u>	Title Random number seeds	Miami Delay Experiments - Stage 1
		Possined from The P
	Start and finish times	Required from Task Force
<u>4.</u> 5.	Print options Airline names	
<u>6.</u> 7.	Processing options Truncation limits	
٤.	Time switch	
	Time switch Tield Physical Characteristics	Grand to the state of the state
		Configuration "A" (Easterly)
9. 10	Ainfield network	
	Number of runways Runway identification	<u> </u>
		<u> </u>
12.	Departure runway and links	
	Runway crossing links	
14.	Exit taxiway location Holding areas	
	Airline gates	
17.	General aviation hasing areas Procedures	<u> </u>
18. 19.	Aircraft separation (See Data Para Route data	ckage No. 1 pp. 7-8 for minimum VFR val
<u>2C.</u> 21.	Two-way path data Common approach paths	y -
	أحبب المرابات المقروف والقامي والتهبي الرجيل والمراجع القابات المروامية معاقبون والمرابات المراجع	
	Vectoring delays	
<u>23.</u> 24.	Departing runway quaue control Gate hold control	
25. 26.	Departure airspace constraints Departure queue	
Airc	Runway crossing delay control raft Operational Characteristics	
28.		
<u> 29.</u>	Exit taxiway utilization Arrival runway occupancy times	
30.		
31.	Touch-and-go runway occupancy time Departure runway occupancy times	S
32.	Taxi speeds	
33.	Approach speeds	
34.	Gate service times	
35		
36.	Airsoace travel times Runway crossing times	
37.		Required Data from Task Force
38.	والمرابي والبراء المتعارف والمتعارف والمتعارف والمتعارف والمتعارف والمتعارف والمتعارف والمتعارف والمتعارف	1978 Demand with Demand Input Distribu-
	veneriti i	APPO PERMANA WILL DERIND INDUC INSTRICT

TABLE 3
ARRIVAL AND DEPARTURE RUNWAY/GATE DISTRIBUTIONS*

% of Class 1: Arrival Runway/Gate Distribution

		Ar	rivals			
Rwy	9R	9L	12	27R	27L	30
Gate Area	(No cf Arcft)	()	()		()	()
1		2.2		.7 (1)		.7 (1)
2	2.2 (3)	10.5 (14)		.7		2.2 (3)
3	1.5 (2)	4.0 (5)		.7 (1)		2.2
4	1.5 (2)	5.2 (7)		.7		
5	9.0 (12)	1.5 (2)		.7 (1)		4.0 (5)
6	12.7 (17.)	1.5 (2)		1.5	1.5 (2)	1.5 (2)
7	6.0 (8)					2.2 (3)
8	5.0 (6)			1.5 (2)		
9	4.0 (5)				.7 (1)	.7 (1)
10-17						
18		.7				
19		.7 (1)				.7 (1)
20		.7 (1)				

^{*}Distributions derived from Miami field-data collection of 10/30/78 through 11/3/78.

% of Class 1: Arrival Runway/Gate Distribution

2			Arriva.	ls		
Rwy	9R	9L	12	27R	27L	30
Gate Area	(No of Arcft)	()	()	()	()	()
21	4.0 (5)					
22	.7					
23	4.0 (5)			.7 (1)		

% of Class 2: Arrival Runway/Gate Distribution

			Arriva	ls		
Rwy	9R	9L	12	27R	27L	30
Gate Area	(No of Arcft)	()	()	()	()	()
1		.2 (1)				
2	1.2 (6)	9.4 (49)		1.5 (8)		.6 (3)
3	.2	10.5 (55)	.2 (1)	2.3 (12)		1.2 (6)
4	.2 (1)	3.1 (16)		.4 (2)		1.3
5	.9 (5)	.4 (2)			.2	1.7
6	10.2 (53)	1.5 (8)	.2 (1)	1.3 (7)	.2 (1)	1.5 (8)
7	7.3 (38)	2.1 (11)		.4 (2)	.4 (2)	.9 (5)
8	7.3 (38)	.8 (4)	.4 (2)	1.5 (8)	.6 (3)	.8 (4)
9	9.2 (48)	.2 (1)	.9 (5)	1.5 (8)	.6 (3)	1.9 (10)
10-15						
16	.2 (1)	.2 (1)		.2		
17	.8 (4)	2.3 (12)		.8 (4)		.9 (5)
18	.2 (1)	3.1 (16)		.2		.6 (3)

% of Class 2: Arrival Runway/Gate Distribution

		Arr	ivals			
Rwy	9R	9L	12	27R	27L	30
Gate Area	(No of Arcft)	()	()	()	()	()
19	.4 (2)	1.3 (7)				.4 (2)
20						
21	.2 (1)					
22	.6 (3)					
23	.4 (2)					
				·		

of Class 3: Arrival Runway/Gate Distribution

			Arriva	ls		
Rwy	9R	9L	12	27R .	27L	30
Gate Area	(No of Arcft)	()	()	()	()	()
1						
2		.8 (1)				
3		9.1 (12)	.8 (1)	.8 (1)		
4		.8 (1) —		_		
5		.8 (1)				
6	6.0 (8)	.8 (1)				2.3 (3)
7	.8 (1)					
8	.8 · (1)					
9	6.0 (8)	2.3 (3)				2.3 (3)
10-16						
17	2.3 (3)	30.3 (40)		7.5 (10)		1.5 (2)
18	1.5 (2)	12.0 (16)		5.3 (7)		2.3 (3)
19		1.5 (2)		1.5 (2)		

% of Class 4: Arrival Runway/Gate Distribution

		Arrivals				
Rwy	9R	9L	12	27R	27L	30
Gate Area	(No of Arcft)	()	()	()		
1						
2						
3		6.7 (1)				
4-8						
9		6.7 (1)				
10-16						
17		40.0 (6)		6.7 (1)		
18		26.6 (4)		13.3 (2)		
19-23						
						·

% of Class 1: Departure Runway/Gate Distribution

Donner		Depa	rtures		رايسة مين المسيوري	
Rwy	9 R	ar	12	27R	27L	30
Gate Area	(No of Arcft)	()	()	()	()	()
1		1.6 (2)	.8 (1)	2.4 (3)		
2		12.0 (15)	2.4 (3)	4.0 (5)		
3		5.0 (6)		.8 (1)		
4		5.0 (6)	2.4 (3)	.8 (1)		
ā	.8 (1)	8.1 (10)	.8 (1)	2.4 (3)	1.6 (2)	
6	4.0 (5)	.8 (1)	.8 (1)		2.4 (3)	
7	3.2 (4)	.8 (1)	.8		1.6 (2)	
8	5.0 (6)				1.6 (2)	
9	7.3 (9)	1.6 (2)			2.4 (3)	
10-12						
13	.8 (1)					
14-16						
17	.8 (1)	1.6 (2)				

% of Class 1: Departure Runway/Gate Distribution

7		D	epartur	es		
Rwy	9R	9L	12	27R	27L	30
Gate Area	(No of Arcft)	()	()	()	()	()
18				1.6 (2)		
19		.8 (1)	.8 (1)			
20		1.6 (2)				
21		.8 (1)	1.6 (2)	.8 (1)		
22	.8 (1)					
23	2.4 (3)	1.6 (2)			.8 (1)	

% of Class 2: Departure Runway/Gate Distribution

		De	parture			
Rwy	9R	9L	12	27R	27L	30
Gate Area	No of Acrft	(%)	(%)	(")	(%)	(%)
1		1.4 (6)		.2 (1)		
2		6.6 (29)	3.4 (15)	2.3 (10)		
3		10.4 (46)	3.4 (15)	2.9 (13)		
4		4.3 (19)	.9 (4)	1.8 (8)	.2 (1)	
5	.5 (2)	.9 (4)	.2 (1)	1.1 (5)	.5 (2)	
6	4.5 (20)	1.1 (5)*	.3 (1)		1.8 (8)	
7	9.5 (42)	.2 (1)			1.6 (7)	
8	8.3 (37)	.2 (1)	.2 (1)		3.4 (15)	
9	13.1 (58)	.5 (2)			3.8 (17)	
10-12						
13		.2 (1)				
14		.5 (2)				
15			.2 (1)			

% of Class 2: Departure Runway/Gate Distribution

		D∈	partur	es		
Rwy	9R	9L	12	27R	27L	30
Gate Area	(No of Arcft)	()	()	()	()	()
16						
17	.2 (1)	2.9 (13)	.5 (2)	1.1 (5)		
18		1.4 (6)		.5 (2)		
19		.7 (3)				
20		.5 (2)	.2	.9 (4)		
21						
22	.2 (1)					
23	.2 (1)				.2 (1)	

% of Class 3: Departure Runway/Gate Distribution

		Der	parture	s		
Rwy	9R	9L	12	27R	271.	30
Gate Area	(No of Arcft)				()	()
1						
2		.9				
3		7.0 (8)		.9 (1)		
4	.9 (1)					
5	.9					
6		1.8 (2)				
7						
8	.9 (1)					
9	12.2 (14)	1.8 (2)	1.8 (2)		3.5 (4)	
10-15						
16		1.8 (2)				
17		33.3 (38)	2.6 (3)	13.9 (16)		
18		13.1 (15)		1.8 (2)	.9 (1)	

% of Class 4: Departure Runway/Gate Distribution

		Departures								
Rwy	9R	9L	12	27R	27L	30				
Gate Area	(No.of Arcft)		()		()					
1										
2										
3		3.2 (1)								
4		3.2 (1)								
5-8										
9	9.7 (3)					•				
10-16										
17		38.7 (12)		16.0 (5)						
18		12.9 (4)	3.2	9.7 (3)						
19										
20				3.2 (1)						
21-23										

TABLE 4 ARRIVAL FIX/RUNWAY DISTRIBUTIONS*

% of Class 1: Arrival Fix/Runway Distribution

(Kmay Runway	innoi j	OWNER	÷ FAMIN	€ WESTO	FORT F LAUDERDALE	BISCAYNE S BAY	(WIW)	NORTHEAST Z QUADRANT
9R	18.8 (12)	42.2 (27)	6.2 (4)	32.8 (21)				
9L	17.6 (6)	35.3 (12)	20.6 (7)	26.5 (9)				
12				100.0 (2)				
27R	70.0 (7)		10.0 (1)	20.0 (2)				
27L		33.3 (1)		66.7 (2)				
30		46.6 (7)	26.7 (4)	26.7 (4)				

Distributions derived from Miami field-data collection of 10/30/78 through 11/3/78.

% of Class 2: Arrival Fix/Runway Distribution

RUNWAY	LONNI	OWNER	FAMIN	WESTO	FORT LAUDERDALE	BISCAYNE BAY	MIAMI	NORTHEAST QUADRANT
(Rwy)	(L)	(0)	(F)	(₩)	(FLL)	(BSY)	(MIA)	(NE)
9R	29.4 (57)	23.2 (45)	19.6 (38)	25.3 (49)	.5 (1)	1.0 (2)	1.0	
9L	43.6 (79)	11.6 (21)	3.9 (7)	38.7 (70)	1.7 (3)	.5 (1)		
12	40.0 (4)		20.0 (2)	30.0 (3)	10.0 (1)			
27R	78.0 (39)	8.0 (4)		14.0 (7)				
27L	66.6 (4)	16.7 (1)	16.7 (1)					
30		29.6 (16)	22.2 (12)	48.2 (26)				

% of Class 3: Arrival Fix/Runway Distribution

RUNWAY	I 'ONN I	OWNER	FAMIN	WESTO	FORT LAUDERDALE	BISCAYNE BAY	MIAMI	NORTHEAST QUADRANT
(Rwy	(L)	(0)	(F)	(W)	(FLL)	(BSY)	(MIA)	(NE)
9R		12.5 (1)	62.5 (5)	12.5 (1)		12.5 (1)		
9L	25.4 (15)	15.2 (9)		44.1 (26)	1.7 (1)		5.1 (3)	8.5 (5)
12								
27R	100.0							
27L								
30		100.0						

% of Class 4: Arrival Fix/Runway Distribution

RUNWAY	LONNI	OWNER	FAMIN	WESTO	FORT LAUDERDALE	BI SCAYNE BAY	MIAMI	NORTHEAST QUADRANT
(Rwy)	(L)	(0)	(F)	(W)	(FLL)	(BSY)	(MIA)	(NE)
9R						100.0 (1)		
9L	11.1 (1)			66.7 (6)			11.1	11.1
12								
27R	·							
27L								
30								

Table 5

ARRIVAL AIRCRAFT LATENESS DISTRIBUTION (Average deviation from schedule, excluding delays due to destination airport)

Amount of time late or early	Percent of flights late or early (%)		
More than 15 min. early less than 15 min. early On time less than 5 minutes late 5 to 10 minutes late 10 to 15 minutes late 15 to 30 minutes late 30 to 45 minutes late 45 to 60 minutes late more than 60 minutes late	0 5 24 29 15 9 9		
more than oo minutes rate	J		

Source: Peat, Marwick, Mitchell & Co., analysis of data provided by Stapleton Task Force

EXPERIMENT NO. 7

Objective:

To assess the delay impact to aircraft in 1983 for the following runway configuration under VFR1 conditions, assuming no airport or ATC system improvements have been implemented:

ARRIVAL RUNWAYS

DEPARTURE RUNWAYS

9L, 9R, 12

9L, 9R, 12

Related Comparison Experiments:

Prior experiment 1 serves as the 1978 demand level baseline for comparison to this experiment. Experiment 11 assesses the delays that accrue after adding near-term airport and ATC system improvements to this study case.

- . 1983 demand
- . 1983 demand input distributions (arrival fix, runways, gates)

	IMULATION MODEL INPUT	
J.	IMOLATION MODEL INPU!	DESCRIPTION OF INPUT CHANGE
A. Lo	ogistics	
1	. Title	
2.	. Random number seeds	
3.	. Start and finish times	
4.	. Print options	
5.	. Airline names	
	. Processing options	
7.		
8.		
₿. A?	rrield Physical Characteristics	Configuration "A" (Fasterly)
	المراج المراجع والمراجع	
10	The state of the s	
11.	. Runway identification	
12.	. Departure runway and links	
	Runway crossing links	
14.		
15.		
16.	. Airline gates	
17.		
	Procedures	
18.	Aircraft separation	
19.		
<u>20.</u>	Two-way path data Common approach paths	
	المريبين الأنبأ المتاك التبارات المتبرة التراجين والتبارين والميريني كارجوب والزواد والمراج المتبرين	
22.		
23. 24.		
25. 26.		
<u>27.</u> D. Air	Runway crossing delay control craft Operational Characteristics	
28.		
<u> 29.</u>	Arrival runway occupancy times	
30.		
31.	Departure runway occupancy times	
32.	Taxi speeds	
33.		
34	Gate service times	
35	Airspace travel times	
36.	Runway crossing times	
37.	Lateness distributions	
38.	Demand	1983 Demand with Demand Input
		Distributions (Required Data From Task

EXPERIMENT NO. 11

Objective:

To assess delays to aircraft in 1983 for the following runway configuration under VFR1 conditions, assuming the Miami near-term airport improvements and the improved (pre-1985) ATC system scenario:

ARRIVAL RUNWAYS
9L, 9R, 12

DEPARTURE RUNWAYS

9L, 9R, 12

Related Comparison Experiments:

Prior experiment 7 serves as the 1983 demand level baseline for comparison to this experiment.

Experiment 14 assesses the delays that accrue after reducing the G. A. traffic of this study case by 50 percent.

- . Near-term improvements to runways 9L, 9R, and 12, as described on pages B-1 through B-8 of the Miami International Airport Improvement Program Technical Plan (October 1978).
- . Pre-1985 VFR separation values.
- . Route data and exit taxiway utilization for 9L improvements.

SIMULATION MODEL INPUT	DESCRIPTION OF INPUT CHANGE
A. Logistics	
l. Title	
2. Random number seeds	
Start and finish times	
4. Print options	
5. Airline names	
6. Processing options	
7. Truncation limits	
8. Time switch	
B. Airfield Physical Characteristics	Configuration "A" (Easterly)
9. Airfield network	
10 Number of runways	
II. Kunway identification	
12. Departure runway and links	
13. Runway crossing links	
14. Exit taxiway location	
15. Holding areas	
l6. Airline gates	
17. General aviation basing areas	
C. ATC Procedures	
18. Aircraft separation	Pre-1985 VFR Separation Values
19. Route data	Improvement #1
20. Two-way path data	
21. Common approach paths	
22. Vectoring delays	
23. Departing runway queue control	
24. Gate hold control	
25. Departure airspace constraints 26. Departure queue	
27. Runway crossing delay control D. Aircraft Operational Characteristics	
28. Exit taxiway utilization 29. Arrival runway occupancy times	Improvement #1
77	
31. Departure runway occupancy times	
32. Taxi speeds	
33. Approach speeds	
34. Gate service times	
35 Airsnace travel times	
36. Runway crossing times	
37. Lateness distributions	
38. Demand	Improvement #3 Lifts Restriction on
	B747 Takeoff from Runway 12

TABLE 6
PRE-1985 VFR SEPARATION VALUES*

A. Arrival-Arrival Separation (nmi) - VFR - Without Buffer

		Trail	Trail Aircraft Class				
		A	В	С	D		
Lead	Α	1.9	1.9	1.9	1.9		
Aircraft	В	1.9	1.9	1.9	1.9		
Class	С	2.7	2.7	1.9	1.9		
	D	4.0	4.0	3.0	2.7		

B. Departure-Departure Separations (seconds) - VFR

		ITALL	Trair Arrefalt Class					
		A	В	С	D			
Lead	A	35	35	45	50			
Aircraft	В	35	35	45	50			
Class	C	50	50	60 ·	60			
	D	120	120	120	90			

TABLE 6 - Continued

C. Departure-Arrival Separation (nmi) - VFR

		Trail	Aircraft	Class	<u> </u>
		A	В	С	D
Lead	A	1,35	1.35	1.35	1.35
Aircraft	В	1,35	1.35	1.35	1.35
Class	С	1,65	1.65	1.65	1.65
	D	1.77	1.77	1.77	1.77

D. Arrival-Departure Separation (seconds) - VFR

		Trail	Aircraft	Class	
		A	В	С	D
Lead Aircraft Class	A B C D	48 46 52 56	48 46 52 56	48 46 52 56	48 46 52 56

^{*}The separations shown are minimum values.
Simultaneous use of runways 9R/12 will be affected by setting their arrival/departure dependencies to zero (Unless changed by Task Force discussion).

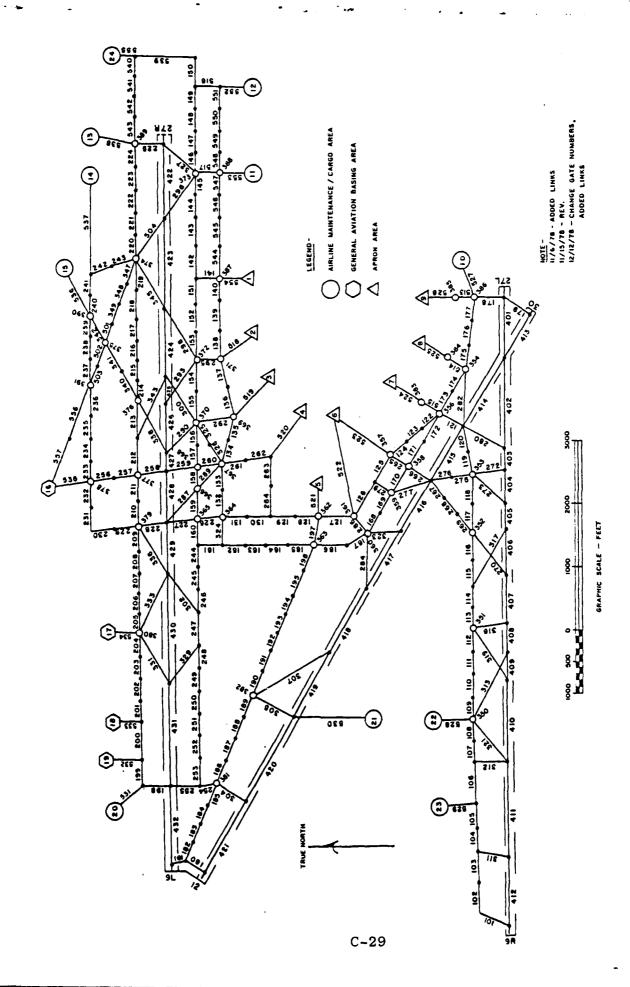


FIGURE 9 - EASTERLY CONFIGURATION IMPROVEMENT WORKSHEET

EXPERIMENT NO. 14

Objective:

To assess delays to aircraft in 1983 for the following runway configuration under VFR1 conditions, assuming that the upgrading of Opa Locka and Tamiami reliever airports has affected a 50-percent reduction in G. A. traffic at Miami.

ARRIVAL RUNWAYS 9L, 9R, 12 DEPARTURE RUNWAYS

9L, 9R, 12

Related Comparison Experiments:

Prior experiment 11 serves as the baseline for comparison to this experiment, wherein the conditions of this study case were identical except for the 50-percent reduction in G. A. traffic at Miami.

Remaining Data Items:

. General Aviation demand reductions for Class 1 (D), Class 2 (C), Class 3 (B), and Class 4 (A). (Total 50-percent Reduction in General Aviation)

SIMULATION MODEL INPUT	DESCRIPTION OF INPUT CHANGE
A. Logistics	
l. Title	
2. Random number seeds	
3. Start and finish times	
4. Print options	
5. Airline names	
6. Processing options	
7. Truncation limits	
8. Time switch	
B. Airfield Physical Characteristics	C. C. (Faster 2.)
	Configuration "A" (Easterly)
9. Airfield network 10 Number of runways	
11. Kunway identification	
والأحبيب والمستهيد والمستوال والمستوار والمستوال والمستو	
12. Departure runway and links	
13. Runway crossing links	
14. Exit taxiway location 15. Holding areas	
15. Airline gates	
i. General aviation basing areas	
C. ATC Procedures	
18. Aircraft separation	
19. Route data	
20. Two-way path data 21. Common approach paths	
22. Vectoring delays	
23. Departing runway queue control	
24. Gate hold control	
25. Departure airspace constraints	
26. Departure queue	
27. Runway crossing delay control	
D. Aircraft Operational Characteristics	
28. Exit taxiway utilization	
29. Arrival runway occupancy times	
louch-and-do runway occupancy ti	imes
31. Departure runway occupancy times	
32. Taxi speeds	
33. Approach speeds	
34. Gate service times	
35 Airepace travel times	
36. Runway crossing times	
37. Lateness distributions	
38. Demand	50% Less General Aviation

EXPERIMENT NO. 4

Objective:

To obtain baseline delay estimates for the following runway configuration in IFR1 for 1978 demand:

ARRIVAL RUNWAYS

DEPARTURE RUNWAYS

9L, 9R

9L, 9R, 12

Related Comparison Experiments:

Prior experiment 1 examines this configuration with VFR1 weather and 1978 demand.

Experiment 6 assesses the delay impact of moving from IFR1 to IFR2 conditions.

Experiment 9 also compares to this study case, wherein demand is increased to the 1983 level under IFR1 conditions. Remaining Data Items:

- . 1978 IFR separation values
- . 1978 demand input distributions (Runway 12 arrivals in experiment 1 redistributed to runways 9L and 9R).
- . Arrival runway occupancy times (from capacity study): Delay study VFR1 values + 5 seconds.

SIMULATION MODEL INPUT	DESCRIPTION OF INPUT CHANGE
A. Logistics	
l. Title	
2. Random number seeds	
3. Start and finish times	
4. Print options 5. Airline names	
6. Processing options 7. Truncation limits	
8. Time switch	
B. Airfield Physical Characteristics	
	Configuration "A" (Easterly)
9. Airfield network 10 Number of runways	
10 Number of runways	
12. Departure runway and links	
Manual Crossing Files	
14. Exit taxiway location	
15. Holding areas	
16. Airline gates	
17. General aviation hasing areas	
C. ATC Procedures	
18. Aircraft separation	1978 IEB Separation Values
19. Route data	
20. Two-way path data	
21. Common approach paths	
22. Vectoring delays	
23. Departing runway queue control	
24. Gate hold control	
25. Departure airspace constraints	
26. Departure queue	
27. Runway crossing delay control	
D. Aircraft Operational Characteristics	
28. Exit taxiway utilization	
29. Arrival runway occupancy times	IFR1 Weather Conditions: VFR + 5 sec
30. Touch-and-go runway occupancy time	
Departure runway occupancy times	
32. Taxi speeds	
33. Approach speeds	
34. Gate service times	
35 Airchace travel times	
36. Runway crossing times	
37. Lateness distributions	
38. Demand	Demand Input Distribution(Arrivals on
	Runway 12 Redistributed to 9L and 9R)

TABLE 7
1978 IFR SEPARATION VALUES*

A. Arrival-Arrival Separation (nmi) - IFR - Without Buffer

		Trail	Aircra	ft Clas	<u>ss</u>
		A	В	С	D
Lead	A	3.0	3.0	3.0	3.0
Aircraft	В	3.0	3.0	3.0	3.0
Class	С	4.0	4.0	3.0	3.0
	D	6.0	6.0	5.0	4.0

B. Departure-Departure Separation (seconds) - IFR

		Trail	Aircra	ift Class	3_
		Α	В	С	D
Lead	Α	60	60	60	60
Aircraft	В	60	60	60	60
Class	С	60	60	60	60
	D	120	120	120	90

TABLE 7 - Continued

C. Departure-Arrival Separation (nmi) - IFR

		Trail	Aircraft	Clas	s
		Α	В	С	D
Lead	Α	1.85	1.85	1.85	1.85
Aircraft	В	1.85	1.85	1.85	1.85
Class	С	2.15	2.15	2.15	2.15
	D	2.27	2.27	2.27	2.27

D. Arrival-Departure Separation (seconds) - IFR

		Trail	Aircraft	Class	
		Α	В	С	D
Lead Aircraft Class	A B C D	53 51 57 61	53 51 57 61	53 51 57 61	53 51 57 61

^{*}The separations shown are minimum values.

Departure/Arrival separations assume VFR values + 0.5 nmi.

Arrival/Departure separations assume IFR runway occupancy time equals VFR runway occupancy time + 5 seconds.

EXPERIMENT NO. 6

Objective:

To assess the delay impact to aircraft in 1978 for the following runway configuration under IFR2 conditions (This experiment also establishes baseline delay estimates for comparison to experiment 10):

ARRIVAL RUNWAYS

DEPARTURE RUNWAYS

None

9L

Related Comparison Experiments:

Prior experiment 4 examines this configuration with IFR1 weather and 1978 demand.

Experiment 10 also compares to this study case, wherein demand is increased to the 1983 level under IFR2 conditions.

Remaining Data Items:

. It is suggested that an IFR1/IFR2/IFR1 situation be used for this experiment, with the IFR2 conditions lasting for only a short time (e.g., one-half hour). This will enable the recovery of the airport from the IFR2 deterioration to be studied.

SIMULAT	ION MODEL INPUT	DE	ESCRIPTION OF	INPUT	CHANGE		
A. Logisti	CS						
lTit							
	dom number seeds						
	rt and finish times	_					
		 					_
	nt options line names	 					_
		 					
7. Tru	cessing options ncation limits	├					
	e switch	}					
B. Airtiel	d Physical Characteristics	Conf	iguration '	IAU (T			
		CONT	Iguracion	A (E	asterly		
	field network			·			
	ber of runways way identification	ļ					
		 					
12. Dep 13. Run	arture runway and links	 					
	way crossing links						
14. Exi	t taxiway location ding areas						
	line gates						
17. Gen C. ATC Proc	eral aviation hasing areas						
							
18. Air	craft separation te data						
		ļ					
20. Two	-way path data non approach paths						
	أبير المراوا المراوا المروا المراوا والمراوا والمروان والمراوا والمراوا والمراوا والمراوا والمراوا						
	toring delays						
23. Den 24. Gat	erting runway queue control						
	hold control						
25. Dep	erture airspace constraints						
	irture queue						
D Aircraft	May crossing delay control Operational Characteristics						
28. EX1	taxiway utilization val runway occupancy times						
30							
1000	h-and-go runway occupancy time crture runway occupancy times	2					
							
	speeds oach speeds						
	service times						
							
	nace travel times		··				
	ness distributions		··············				
38. Dema		Only	Departures	on 91.	During	Period	C f
	<u> </u>		Conditions	J UL	- ar Ing	1 C1 1 O U	01
**************************************	**************************************	-37	CONGILIONS				,

EXPERIMENT NO. 9

Objective:

To assess the delay impact to aircraft in 1983 for the following runway configuration under IFR1 conditions, assuming no airport or ATC system improvements have been implemented:

ARRIVAL RUNWAYS

9L, 9R

DEPARTURE RUNWAYS

9L, 9R, 12

Related Comparison Experiments:

Prior experiment 4 serves as the 1978 demand level baseline for comparison to this experiment.

Experiment 10 assess the delay impact of moving from IFR1 to IFR2 conditions under 1983 demand.

- . 1983 demand.
- . 1983 demand input distributions.

SIMULATION MODEL INPUT	DESCRIPTION OF INPUT CHANGE
A. Logistics	
l. Title	
2. Random number seeds	
Start and finish times	
4. Print options	
5. Airline names	
6. Processing options	
7. Truncation limits	
8. Time switch	
B. Airfield Physical Characteristics	Configuration "A" (Factor)
9. Airfield network	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
10 Number of runways	
ii. Runway identification	
12. Departure runway and links	
13. Runway crossing links	
14. Exit taxiway location	
15. Holding areas	
16. Airline gates	
17. General aviation basing areas	
C. ATC Procedures	
18. Aircraft separation	
19. Route data	
20. Two-way path data	
21. Common approach paths	
22. Vectoring delays	
23. Departing runway queue control	
24. Gate hold control	
25. Departure airspace constraints	
26. Departure queue	
27. Runway crossing delay control	
D. Aircraft Operational Characteristics	
28. Exit taxiway utilization	
29. Arrival runway occupancy times	
30. Touch-and-do runway occupancy time	
Departure runway occupancy times	
32. Taxi speeds	
33. Approach speeds	
34. Gate service times	
35 Airchace travel times	
36. Runway crossing times	
37. Lateness distributions	
38. Demand	1983 Demand and Demand Input Distribu
	tions

EXPERIMENT NO. 10

Objective:

To assess the delay impact to aircraft in 1983 for the following runway configuration under IFR2 conditions, assuming no airport or ATC system improvements have been implemented:

ARRIVAL RUNWAYS

DEPARTURE RUNWAYS

None

9L

Related Comparison Experiments:

Prior experiment 6 serves as the 1978 demand level baseline for comparison to this experiment.

Prior experiment 9 examines this configuration with IFR1 weather and 1983 demand.

Experiment 21 assesses the delays that accrue after adding near-term airport and ATC system improvements to this study case.

Remaining Data Items:

- . It is suggested that the same IFR1/IFR2/IFR1 situation used in experiment 6 be used in this experiment. This will allow the recovery from the IFR2 deterioration to be compared between experiments 6 and 10.
- . 1983 demand.
- . 1983 demand input distributions.

SIMULATION MODEL INPUT	DESCRIPTION OF INPUT CHANGE
. Logistics	
l. Title	
2. Random number seeds	
Start and finish times	
4. Print options	
5. Airline names	
6. Processing options	
7. Truncation limits	
8. Time switch	
. Airfield Physical Characteristics	Configuration "A" (Easterly)
9. Airfield network	
10 Number of runways	
11. Runway identification	
12. Departure runway and links	
13. Runway crossing links	
14. Exit taxiway location	
15. Holding areas	
16. Airline gates	
17. General aviation basing areas	
. ATC Procedures	
18. Aircraft separation	
19. Route data	
20. Two-way path data 21. Common approach paths	
22. Vectoring delays	
23. Departing runway queue control 24. Gate hold control	
25. Departure airspace constraints	
26. Departure queue	
27. Runway crossing delay control Aircraft Operational Characteristics	
28. Exit taxiway utilization 29. Arrival runway occupancy times	
30. Touch-and-go runway occupancy time	
31. Departure runway occupancy times	
32. Taxi speeds	
33. Approach speeds	
34. Gate service times	
35 Aircnace travel times	
36. Runway crossing times	·
37. Lateness distributions	

EXPERIMENT NO. 21

Objective:

To assess delays to aircraft in 1983 for the following runway configuration under IFR2 conditions, assuming the Miami near-term airport improvements and the improved (pre-1985) ATC system scenario:

ARRIVAL RUNWAYS

DEPARTURE RUNWAYS

9L, 9R

9L, 9R, 12

Related Comparison Experiments:

Prior experiment 10 serves as the 1983 demand level baseline for comparison to this experiment. This experiment assumes that the near-term airport improvements have enabled arrivals on 9L/9R and experiment on 9L/9R/12 to be operated in IFR2 conditions.

- . Near-term improvements to runways 9L, 9R, and 12, as described on pages B-1 through B-8 of the Miami International Airport Improvement Program Technical Plan.
- . Pre-1985 IFR separation values.
- . Route data and exit taxiway utilization for 9L improvements.

SIMULATION MODEL INPUT	DESCRIPTION OF INPUT CHANGE
A. Logistics	
l. Title	
2. Random number seeds	
3. Start and finish times	
4. Print options	
5. Airline names	
6. Processing options 7. Truncation limits	
8. Time switch	
B. Airfield Physical Characteristics	Configuration "A" (Easterly)
	Configuration in (Hasterly)
9. Airfield network	
10 Number of runways 11. Runway identification	
12. Departure runway and links	
13. Runway crossing links	
14. Exit taxiway location	
15. Holding areas	
16. Airline gates	
17. General aviation basing areas	
C. ATC Procedures	
18. Aircraft separation	Pre-1985 IFR Separation Values
19. Route data	Improvement #1
20. Two-way path data	
21. Common approach paths	
22. Vectoring delays	
23. Departing runway queue control	
24. Gate hold control	
25. Departure airspace constraints	
26. Departure queue	
27. Runway crossing delay control	
D. Aircraft Operational Characteristics	
28. Exit taxiway utilization	Improvement #1
29. Arrival runway occupancy times	
30. Touch-and-go runway occupancy time	c
31. Departure runway occupancy times	
32. Taxi speeds	
33. Approach speeds	
34. Gate service times	
35 Airsnace travel times	
36. Runway crossing times	
37. Lateness distributions	
38. Demand	Improvement #3 Lifts Restrictions on
DEIIRIUS	B747 Takeoff from Runway 12
	12

TABLE 8
PRE-1985 IFR SEPARATION VALUES*

A. Arrival-Arrival Separation (nmi) - IFR - Without Buffer

		Trail	Aircraft	Class	
		A	В	С	D
Lead	A	3.0	3.0	3.0	3.0
Aircraft	В	3.0	3.0	3.0	3.0
Class	С	3.0	3.0	3.0	3.0
	D	4.0	4.0	3.0	3.0

B. Departure-Departure Separation (seconds) - IFR

		Trail	Aircra	ft Clas	<u>ss</u>
·		A	В	С	D
Lead Aircraft Class	A B C D	60 60 60 120	60 60 60 120	60 60 60 120	60 60 60 90

TABLE 8 - Continued

C. Departure-Arrival Separation (nmi) - IFR

		Trail	Aircraft	Class	
		A	В	С	D
Lead Aircraft Class	A B C	1.85 1.85 2.15 2.27	1.85 2.15	1.85 1.85 2.15	1.85 1.85 2.15

D. Arrival-Departure Separation (seconds) - IFR

		Trail	Aircraft	Class	
		A	В	С	D
Lead	A	53	53	53	53
Aircraft Class	B C	51 57	51 57	51 57	51 57
02400	Ď	61	61	61	61

The separations are minimum values.

Departure/Arrival separations assume VFR values + 0.5 nmi.

Arrival/Departure separations assume IFR runway occupancy time equals VFR runway occupancy time + 5 seconds.

Simultaneous use of runways 9R/12 will be affected by setting the 9R arrival/12 departure dependency to zero (Unless changed by Task Force Discussion).

EXPERIMENT NO. 2

Objective:

To obtain baseline delay estimates for the following runway configuration in VFR1 for 1978 demand:

ARRIVAL RUNWAYS

DEPARTURE RUNWAYS

27L, 27R, 30

27L, 27R, 30

Related Comparison Experiments:

Experiment 5 examines this westerly configuration with IFR1 weather and 1978 demand.

Experiment 3 assesses the delay impact of VFR2 conditions and 1978 demand.

Experiment 8 compares to this baseline case, wherein demand is increased to the 1983 level under VFR1 conditions.

Remaining Data Items:

- . Time period to be simulated.
- . 1978 demand.
- . 1978 demand input distributions.

SIMULATION MODEL INPUT	DESCRIPTION OF INPUT CHANGE
A. Logistics	
l. Title	
2. Random number seeds	
Start and finish times	Required from Task Force
4. Print options	
5. Airline names	
6. Processing options	
7. Truncation limits	
8. Time switch	
B. Airfield Physical Characteristics	Configuration "R" (Westerly)
9. Airfield network	
10 Number of runways	
11. Kunway Identification	
12. Departure runway and links	
13. Runway crossing links	
14. Exit taxiway location	
15. Holding areas	
• 16. Airline gates	
17. General aviation basing areas	
C. ATC Procedures	·
18. Aircraft separation	
19. Route data	
20. Two-way path data	
21. Common approach paths	
22. Vectoring delays	
23. Departing runway queue control	
24. Gate hold control	
25. Departure airspace constraints 26. Departure queue	
27. Runway crossing delay control D. Aircraft Operational Characteristics	
28. Exit taxiway utilization 29. Arrival runway occupancy times	
30. Touch-and-go runway occupancy time	
31. Departure runway occupancy times	<u> </u>
32. Taxi speeds	
33. Approach speeds	
34. Gate service times	
35 Airsnace travel times	
36. Runway crossing times	
37. Lateness distributions	
38. Demand	1978 Demand and Demand Input Dis-
	tributions (Required from Task Force)

EXPERIMENT NO. 8

Objective:

To assess the delay impact to aircraft in 1983 for the following runway configuration under VFR1 conditions, assuming no airport or ATC system improvements have been implemented:

ARRIVAL RUNWAYS 27L, 27R, 30

DEPARTURE RUNWAYS 27L, 27R, 30

Related Comparison Experiments:

Prior experiment 2 serves as the 1978 demand level baseline for comparison to this experiment.

Experiment 17 assesses the delay impact of VFR2 conditions and 1978 demand.

- . 1983 demand.
- . 1983 demand input distributions.

parture runway and links nway crossing links it taxiway location Iding areas rline gates neral aviation basing areas cedures rcraft separation ute data noway path data mon approach paths ctoring delays parting runway queue control te hold control parture airspace constraints parture queue nway crossing delay control to Operational Characteristics it taxiway utilization rival runway occupancy times parture runway occupancy times carture runway occupancy times	983 Demand and Demand Input
nway crossing links it taxiway location Iding areas rline gates neral aviation basing areas cedures rcraft separation ute data neway path data mon approach paths ctoring delays parting runway queue control te hold control parture airspace constraints parture queue nway crossing delay control to Operational Characteristics it taxiway utilization rival runway occupancy times parture runway occupancy times control speeds respect times respace travel times respace travel times	
nway crossing links it taxiway location Iding areas rline gates neral aviation basing areas cedures rcraft separation ute data p-way path data mon approach paths ctoring delays parting runway queue control te hold control parture airspace constraints parture queue nway crossing delay control to Operational Characteristics it taxiway utilization rival runway occupancy times parture runway occupancy times	
nway crossing links it taxiway location Iding areas rline gates neral aviation basing areas cedures rcraft separation ute data p-way path data mmon approach paths ctoring delays parting runway queue control te hold control parture airspace constraints parture queue nway crossing delay control to Operational Characteristics it taxiway utilization rival runway occupancy times parture runway occupancy time parture runway occupancy times as is speeds proach speeds	
nway crossing links it taxiway location Iding areas rline gates neral aviation basing areas cedures rcraft separation ute data D-way path data mmon approach paths ctoring delays parting runway queue control te hold control Darture airspace constraints parture queue Tway crossing delay control to Operational Characteristics it taxiway utilization rival runway occupancy time parture runway occupancy time coarture runway occupancy times coarture runway occupancy times coarture runway occupancy times	
nway crossing links it taxiway location Iding areas rline gates neral aviation basing areas cedures rcraft separation ute data D-way path data mmon approach paths ctoring delays parting runway queue control te hold control Darture airspace constraints parture queue Tway crossing delay control to Operational Characteristics it taxiway utilization rival runway occupancy time parture runway occupancy time coarture runway occupancy times coarture runway occupancy times coarture runway occupancy times	
nway crossing links it taxiway location Iding areas rline gates neral aviation basing areas cedures rcraft separation ute data neway path data mon approach paths ctoring delays parting runway queue control te hold control parture airspace constraints parture queue nway crossing delay control to Operational Characteristics it taxiway utilization rival runway occupancy times uch-and-go runway occupancy times	S
nway crossing links it taxiway location Iding areas rline gates neral aviation basing areas cedures rcraft separation ute data neway path data mon approach paths ctoring delays parting runway queue control te hold control parture airspace constraints parture queue nway crossing delay control to Operational Characteristics it taxiway utilization rival runway occupancy times	
nway crossing links it taxiway location Iding areas rline gates neral aviation basing areas cedures rcraft separation ute data o-way path data mmon approach paths ctoring delays parting runway queue control te hold control parture airspace constraints parture queue nway crossing delay control to Operational Characteristics it taxiway utilization	
nway crossing links it taxiway location Iding areas rline gates neral aviation basing areas cedures rcraft separation ute data neway path data mon approach paths ctoring delays parting runway queue control te hold control parture airspace constraints parture queue nway crossing delay control to Operational Characteristics	
nway crossing links it taxiway location lding areas rline gates neral aviation basing areas cedures rcraft separation ute data neway path data mmon approach paths ctoring delays parting runway queue control te hold control parture airspace constraints parture queue	
nway crossing links it taxiway location lding areas rline gates neral aviation basing areas cedures rcraft separation ute data p-way path data mmon approach paths ctoring delays parting runway queue control te hold control parture airspace constraints parture queue	
nway crossing links it taxiway location Iding areas rline gates neral aviation basing areas cedures rcraft separation ute data no-way path data mmon approach paths ctoring delays parting runway gueue control te hold control parture airspace constraints	
nway crossing links it taxiway location Iding areas rline gates neral aviation basing areas cedures rcraft separation ute data neway path data mmon approach paths ctoring delays parting runway queue control	
nway crossing links it taxiway location lding areas rline gates neral aviation basing areas cedures rcraft separation ute data no-way path data mmon approach paths ctoring delays	
nway crossing links it taxiway location lding areas rline gates neral aviation basing areas cedures rcraft separation ute data neway path data nmon approach paths	
nway crossing links it taxiway location lding areas rline gates neral aviation basing areas cedures rcraft separation ute data 0-way path data	
nway crossing links it taxiway location lding areas rline gates neral aviation basing areas cedures rcraft separation ute data	
nway crossing links it taxiway location lding areas rline gates neral aviation basing areas cedures rcraft separation	
nway crossing links it taxiway location lding areas rline gates neral aviation basing areas cedures	
nway crossing links it taxiway location lding areas rline gates neral aviation basing areas	
nway crossing links it taxiway location lding areas	
nway crossing links it taxiway location	
nway crossing links	
parture runway and links	
nawture munual and links	
<u> </u>	
nway identification	
rfield network mber of runways	
	Configuration "B" (Westerly)
me switch	
uncation limits	
ocessing options	
rline names	
	DESCRIPTION OF INPUT CHANGE
1	ocessing options uncation limits me switch Id Physical Characteristics

EXPERIMENT NO. 3

Objective:

To assess the delay impact to aircraft in 1978 for the following runway configuration under VFR2 conditions (This experiment also establishes baseline delay estimates for comparison to experiment 17):

ARRIVAL RUNWAYS

DEPARTURE RUNWAYS

27L. 27R

27L, 27R, 30

Related Comparison Experiments:

Prior experiment 2 examines this configuration with VFR1 weather and 1978 demand.

Experiment 17 also compares to this study case, wherein demand is increased to the 1983 level under VFR2 conditions.

- . Arrivals to runway 30 not conducted under 1978 VFR2 conditions.
- . Demand input distributions (arrivals to runway 30 redistributed to 27L, 27R).

SIMULATION MODEL INPUT	DESCRIPTION OF INPUT CHANGE
A. Logistics	
1. Title	
Random number seeds	
Start and finish times	
4. Print options	
5. Airline names	
6. Processing options	
7. Truncation limits	
8. Time switch	
B. Airfield Physical Characteristi	CS
9. Airfield network	
10 Number of runways	
II. Kunway Identification	
12. Departure runway and links	
13. Runway crossing links	
14. Exit taxiway location	
15. Holding areas	
16. Airline gates	
17. General aviation basing area	
C. ATC Procedures	<u> </u>
18. Aircraft separation	
19. Route data	
20. Two-way path data	
21. Common approach paths	
22. Vectoring delays	
23. Departing runway queue contr	no.1
24. Gate hold control	
25. Departure airspace constrair	n+c
26. Departure queue	
27. Runway crossing delay contro	.1
). Aircraft Operational Characterist	tics
28. Exit taxiway utilization	
29. Arrival runway occupancy tim	nes
30. Touch-and-go runway occupano	
31. Departure runway occupancy t	imes
32. Taxi speeds	
33 Approach speeds	
4 Sate service times	
.E Airsnace travel times	
t Juneau crossing times	
atemess distributions	
	Demand Input Distribution (Arrivals

EXPERIMENT NO. 17

Objective:

To assess the delay impact to aircraft in 1983 for the following runway configuration under VFR2 conditions, assuming no airport or ATC system improvements have been implemented:

ARRIVAL RUNWAYS

DEPARTURE RUNWAYS

27L, 27R

27L, 27R, 30

Related Comparison Experiments:

Prior experiment 3 serves as the 1978 demand level baseline for comparison to this experiment.

Prior experiment 8 examines this configuration with VFR1 weather and 1983 demand.

Experiment 12 assesses the delays that accrue after adding near-term airport and ATC system improvements to this study case. Remaining Data Items:

- . 1983 demand.
- . 1983 demand input distributions.

SIMULATION MODEL INPUT	DESCRIPTION OF INPUT CHANGE
A. Logistics	
l. Title	
2. Random number seeds	
3. Start and finish times	
4. Print options	
5. Airline names	
6. Processing options	
7. Truncation limits	
8. Time switch	
B. Airfield Physical Characteristics	Configuration "B" (Westerly)
9. Airfield network	
10 Number of runways	
II. Kunway identification	
12. Departure runway and links	
13. Runway crossing links	
14. Exit taxiway location	
15. Holding areas	
l6. Airline gates	
17. General aviation basing areas	
C. ATC Procedures	
18. Aircraft separation	
19. Route data	
20. Two-way path data	
21. Common approach paths	
22. Vectoring delays	
23. Departing runway queue control	
24. Gate hold control	
25. Departure airspace constraints	
26. Departure queue	
27. Runway crossing delay control	<u> </u>
D. Aircraft Operational Characteristics	
28. Exit taxiway utilization 29. Arrival runway occupancy times	
(I)	
31. Departure runway occupancy times	S
32. Taxi speeds	
33. Approach speeds	
34. Gate service times	
35 Airspace travel times	
36. Runway crossing times	
37. Lateness distributions	
38. Demand	1983 Demand and Demand Input Distribu
	tions (Required from Task Force)

EXPERIMENT NO. 12

Objective:

To assess delays to aircraft in 1983 for the following runway configuration under VFR2 conditions, assuming the Miami near-term airport improvements and the improved (pre-1985) ATC system scenario:

ARRIVAL RUNWAYS

DEPARTURE RUNWAYS

27L, 27R, 30

27L, 27R, 30

Related Comparison Experiments:

Prior experiment 17 serves as the 1983 demand level baseline for comparison to this experiment. This experiment assumes that improvement item no. 3 has enabled runway 30 arrivals to be conducted under VFR2 conditions.

- . Near-term improvements to runways 27L, 27R, and 30, as described on pages B-1 through B-8 of the Miami International Airport Improvement Program Technical Plan (October 1978).
- . 1983 Demand input distribution: Arrivals on runway 30 permitted under VFR2 due to near-term improvements, assuming waiver on visual separations is granted; short takeoff on runway 30 accommodated by runway 30A in the model.
- . Route data and exit taxiway utilization for 27R improvements.

SIMULATION MODEL INPUT	DESCRIPTION OF INPUT CHANGE
	DESCRIPTION OF THEOT CHANGE
	-
1. Title	
2. Random number seeds	
Start and finish times	
4. Print options	
5. Airline names	
6. Processing options	
7. Truncation limits	
8. Time switch	
B. Airfield Physical Characteristics	Configuration "B" (Westerly)
9. Airfield network	
10 Number of runways	
11. Kunway identification	Additional Runway 30A to accommodate
12. Departure runway and links	short takeoff, Improvement #3
13. Runway crossing links	
14. Exit taxiway location	
15. Holding areas	
16. Airline gates	
17. General aviation basing areas C. ATC Procedures	
18. Aircraft separation	
19. Route data	Improvement #1 and #2
20. Two-way path data	
21. Common approach paths	
22. Vectoring delays	
23. Departing runway queue control	
24. Gate hold control	
25. Departure airspace constraints	
26. Departure queue	
27. Runway crossing delay control	
D. Aircraft Operational Characteristics	
28. Exit taxiway utilization	Improvement #1
29. Arrival runway occupancy times	I I I I I I I I I I I I I I I I I I I
30. Touch-and-go runway occupancy tim	
31. Departure runway occupancy times	
32. Taxi speeds	
33. Approach speeds	
34. Gate service times	
35. Runway crossing times	
37. Lateness distributions	
	Nution (Ameina) - De atti
Departure Including B747 Permitted	bution (Arrivals Permitted on Runway 30 on Runways 30 and Short Takeoff on 30A
== B D. I. I CIMITUUG	Ton Admays to and Short Takeoff on 30A

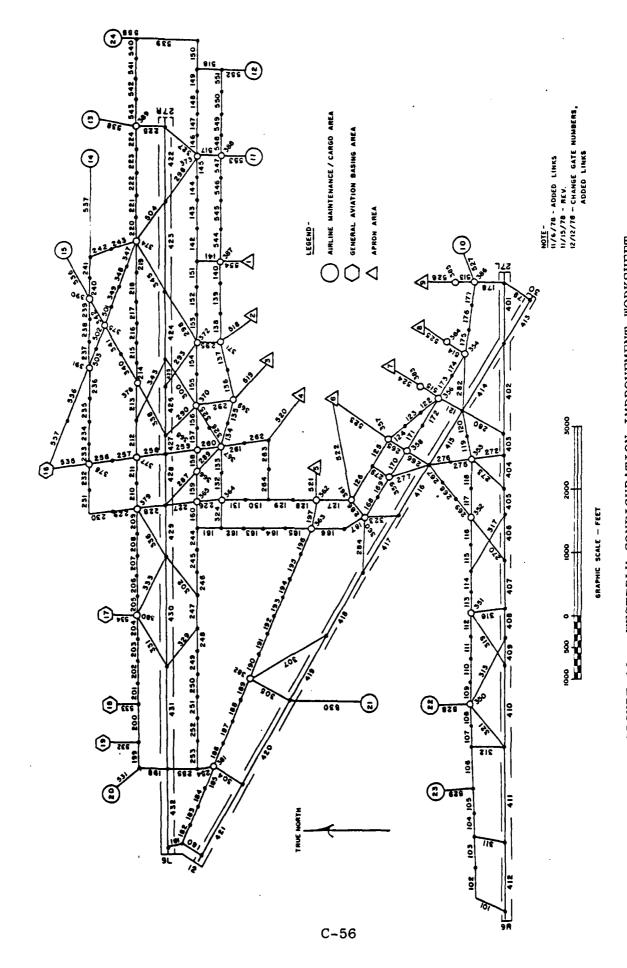


FIGURE 10 - WESTERLY CONFIGURATION IMPROVEMENT WORKSHEET

EXPERIMENT NO. 5

Objective:

To obtain baseline delay estimates for the following runway configuration in IFR1 for 1978 demand:

ARRIVAL RUNWAYS

27L, 27R

DEPARTURE RUNWAYS

27L, 27R

Related Comparison Experiments:

Prior experiment 2 examines this configuration with VFR1 weather and 1978 demand.

Experiment 15 assesses the delays that accrue after adding the near-term airport and ATC system improvements to this study case.

- . 1978 Demand input distribution (arrival and departure demand distributions for runway 30 shifted to 27L and 27R).
- . Arrival runway occupancy times (from capacity study): Delay study VFR1 values + 5 seconds.

A. Logistics 1. Title 2. Random number seeds 3. Start and finish times 4. Print options 5. Airline names 6. Processing options 7. Truncation limits 8. Time switch 8. Airfield Physical Characteristics Configuration "B" (Westerly) 9. Airfield network 10 Number of runways	
1. Title 2. Random number seeds 3. Start and finish times 4. Print options 5. Airline names 6. Processing options 7. Truncation limits 8. Time switch 8. Airfield Physical Characteristics Configuration "B" (Westerly) 9. Airfield network	
2. Random number seeds 3. Start and finish times 4. Print options 5. Airline names 6. Processing options 7. Truncation limits 8. Time switch 3. Airfield Physical Characteristics Configuration "B" (Westerly) 9. Airfield network	-
3. Start and finish times 4. Print options 5. Airline names 6. Processing options 7. Truncation limits 8. Time switch 9. Airfield Physical Characteristics Configuration "B" (Westerly) 9. Airfield network	<u> </u>
4. Print options 5. Airline names 6. Processing options 7. Truncation limits 8. Time switch 6. Airfield Physical Characteristics Configuration "B" (Westerly) 9. Airfield network	-
5. Airline names 6. Processing options 7. Truncation limits 8. Time switch 6. Airfield Physical Characteristics Configuration "B" (Westerly) 9. Airfield network	
6. Processing options 7. Truncation limits 8. Time switch 6. Airfield Physical Characteristics Configuration "B" (Westerly) 9. Airfield network	
7. Truncation limits 8. Time switch 8. Airfield Physical Characteristics Configuration "B" (Westerly) 9. Airfield network	
8. Time switch 3. Airfield Physical Characteristics Configuration "B" (Westerly) 9. Airfield network	
9. Airfield Physical Characteristics Configuration "B" (Westerly)	
9. Airfield network	
10 Number of runwave	-
12. Departure runway and links	
13. Runway crossing links	
14. Exit taxiway location	
15. Holding areas	
16. Airline gates	
17. General aviation basing areas	
. ATC Procedures	
18. Aircraft separation 1978 IFR Separation Values 19. Route data	-
	-
20. Two-way path data 21. Common approach paths	-
23. Departing runway queue control 24. Gate hold control	-
25. Departure airspace constraints 26. Departure queue	
27. Runway crossing delay control D. Aircraft Operational Characteristics	
	+ 5 50
29. Arrival runway occupancy times IFR1 Weather Conditions: VFR1 30. Touch-and-go runway occupancy times	. + 5 SE
31. Departure runway occupancy times	
32. Tax1 speeds	
33. Approach speeds	
34. Gate service times	
35 Airspace travel times	
36. Runway crossing times	
37. Lateness distributions	
38. Demand Arrival and Departure Demand	Distribu
for Runway 30 Shifted to 27L	and 27R

EXPERIMENT NO. 15

Objective:

To assess delays to aircraft in 1983 for the following runway configuration under IFR1 conditions, assuming the Miami near-term airport improvements and the improved (pre-1985) ATC system scenario:

ARRIVAL RUNWAYS
27L, 27R

DEPARTURE RUNWAYS 27L, 27R

Related Comparison Experiments:

Prior experiment 5 serves as the 1978 demand level baseline for comparison to this experiment, wherein no near-term improvements were implemented.

Experiment 20 assesses the delays that accrue after reducing the G. A. traffic of this stucy case by 50 percent.

- . Near-term improvements to runways 27L and 27R, as described on pages B-1 through B-8 of the Miami International Airport Improvement Program Technical Plan.
- . 1983 demand.
- . 1983 demand input distributions.
- . Will short departures be permitted on runway 30 under these conditions?

A. Logistics 1. Title 2. Random number seeds 3. Start and finish times 4. Print contions 5. Airline names 6. Processing options 7. Truncation limits 8. Time switch 8. Time switch 9. Airfield network 10. Number of runways 11. Kunway toerthircation 12. Departure runway and links 13. Runway crossing links 14. Exit taxiway location 15. Holding areas 16. Airline gates 17. General aviation basing areas 18. Aircraft separation 19. Route data 20. Two-way path data 21. Common approach paths 22. Vectoring delays 23. Departure airspace constraints 26. Departure airspace constraints 27. Runway crossing links 19. Route data 10. Aircraft operational Characteristics 19. Aircraft operational Characteristics 21. General aviation basing areas 22. Vectoring delays 23. Departure queue 27. Runway crossing delay control 28. Exit taxiway utilization 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Lateness distributions 36. Runway crossing times 37. Lateness distributions 38. Demand 39. Demand 39. Demand 39. Demand 39. Demand 39. Demand 39. Demand 39. Demand 39. Demand 39. Demand 30. Lateness distributions 39. Demand 30. Lateness distributions	SIMULATION MODEL INPUT	DESCRIPTION OF INPUT CHANGE
1. Title 2. Random number seeds 3. Start and finish times 4. Print ontions 5. Airline names 6. Processing options 7. Iruncation limits 8. Time switch 8. Airfield nerwork 10. Number of runways 11. Kunway identification 12. Departure runway and links 13. Runway crossing links 14. Exit taxiway location 15. Holding areas 16. Airline gates 17. General aviation basing areas 18. Aircraft separation 19. Route data 20. Two-way gath data 21. Common approach paths 22. Vectoring delays 23. Departure runway queue control 24. Gate hold control 25. Departure airspace constraints 26. Departure queue 27. Runway crossing delay control 28. Exit taxiway utilization 29. Aircraft Operational Characteristics 29. Arrival runway queue 27. Runway crossing delay control 28. Exit taxiway utilization Improvement #1 29. Arrival runway occupancy times 30. Jouch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Lateness distributions 36. Runway crossing intenses 37. Lateness distributions 38. Demand 38. Demand 39. Demand 39. Demand 39. Demand 39. Demand 39. Demand 39. Demand	A. Logistics	
2. Random number seeds 3. Start and finish times 4. Print notions 5. Arrive names 6. Processing options 7. Truncation limits 8. Time switch 8. Airfield Physical Characteristics Configuration "B" (Westerly) 9. Airfield network 10. Number of runways 11. Kunway toertification 12. Departure runway and links 13. Runway crossing links 14. Exit taxiway location 15. Holding areas 16. Airline gates 17. General aviation basing areas 18. Aircraft separation Pre-1985 IFR Separation Volumes 19. Route data Improvement #1 20. Two-way path data 21. Common approach paths 22. Vectoring delays 23. Departure queue 27. Runway crossing delay control 24. Gate hold control 25. Departure queue 27. Runway crossing delay control 28. Exit taxiway utilization Improvement #1 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Aireasa traval times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Input Distributions 38. Demand		
4. Print ontions 5. Airline names 6. Processing options 7. Truncation limits 8. Time switch B. Airfield Physical Characteristics Configuration "B" (Westerly) 9. Airfield network 10. Number of runways 11. Kunway identification 12. Departure runway and links 13. Runway crossing links 14. Exit taxiway location 15. Holding areas 16. Airline gates 17. General aviation hasing areas 18. Aircraft separation 19. Route data Improvement #1 20. Two-way path data 21. Common approach paths 22. Vectoring delays 23. Departure airspace constraints 24. Gate hold control 25. Departure airspace constraints 26. Departure queue 27. Runway crossing delay control 28. Exit taxiway utilization 29. Aircraft Operational Characteristics 28. Exit taxiway utilization 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Laput Distributions 38. Demand		
4. Print options 5. Airline names 6. Processing options 7. Truncation limits 8. Time switch 8. Airlinel Physical Characteristics Configuration "B" (Westerly) 9. Airfield network 10. Number of runways 11. Kunway identification 12. Departure runway and links 13. Runway crossing links 14. Exit taxiway location 15. Holding areas 16. Airline gates 17. General aviation hasing areas 18. Aircraft separation 19. Route data Improvement #1 20. Two-way path data 21. Common approach paths 22. Vectoring delays 23. Departure airspace constraints 24. Gate hold control 25. Departure queue 27. Runway crossing delay control 28. Exit taxiway utilization 29. Aircraft operational Characteristics 28. Exit taxiway utilization 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Laput Distributions 38. Demand 1983 Demand and Demand Laput Distributions	3. Start and finish times	
5. Airline names 6. Processing options 7. Truncation limits 8. Time switch 15. Airlield Physical Characteristics Configuration "B" (Westerly) 9. Airfield network 10. Number of runways 11. Kunway Identification 12. Departure runway and links 13. Runway crossing links 14. Exit taxiway location 15. Holding areas 16. Airline gates 17. General aviation basing areas 18. Aircraft separation 19. Route data Improvement #1 20. Two-way path data 21. Common approach paths 22. Vectoring delays 23. Departure airspace constraints 24. Gate hold control 25. Departure queue 27. Runway crossing delay control 28. Exit taxiway utilization Improvement #1 29. Arrival runway occupancy times 30. Douch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Laput Distributions 38. Demand 1983 Demand and Demand Laput Distributions		
7. Iruncation limits 8. Time switch B. Airfield Physical Characteristics Configuration "B" (Westerly) 9. Airfield network 10. Number of runways 11. Kunway Identification 12. Departure runway and links 13. Runway crossing links 14. Exit taxiway location 15. Holding areas 16. Airline gates 17. General aviation basing areas 18. Aircraft separation Pre-1985 IFR Separation Values 19. Route data Improvement #1 20. Two-way path data 21. Common approach paths 22. Vectoring delays 23. Departure airspace constraints 24. Gate hold control 25. Departure queue 27. Runway crossing delay control 28. Exit taxiway utilization 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace traval times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Input Distributions 38. Demand		
7. Iruncation limits 8. Time switch B. Airfield Physical Characteristics Configuration "B" (Westerly) 9. Airfield network 10. Number of runways 11. Kunway Identification 12. Departure runway and links 13. Runway crossing links 14. Exit taxiway location 15. Holding areas 16. Airline gates 17. General aviation basing areas 18. Aircraft separation Pre-1985 IFR Separation Values 19. Route data Improvement #1 20. Two-way path data 21. Common approach paths 22. Vectoring delays 23. Departure airspace constraints 24. Gate hold control 25. Departure queue 27. Runway crossing delay control 28. Exit taxiway utilization 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace traval times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Input Distributions 38. Demand	6. Processing ontions	
B. Airfield Physical Characteristics Configuration "B" (Westerly) 9. Airfield network 10. Number of runways 11. Runway dentification 12. Departure runway and links 13. Runway crossing links 14. Exit taxiway location 15. Holding areas 16. Airline gates 17. General aviation basing areas 18. Aircraft separation Pre-1985 IFR Separation 19. Route data Improvement #1 20. Iwo-way path data 21. Common approach paths 22. Vectoring delays 23. Departing runway queue control 24. Gate hold control 25. Departure airspace constraints 26. Departure queue 27. Runway crossing delay control 28. Exit taxiway utilization Improvement #1 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Input Distribus 38. Demand 1983 Demand and Demand Input Distribus 39. Touch-and-go runway dimes 30. Taxi speeds 31. Lateness distributions 32. Lateness distributions 33. Demand 1983 Demand and Demand Input Distribus 34. Demand 1983 Demand and Demand Input Distribus 35. Airspace travel Input Distribus 36. Runway crossing times 37. Lateness distributions	7. Truncation limits	
B. Airfield Physical Characteristics Configuration "B" (Westerly) 9. Airfield network 10. Number of runways 11. Kunway Identification 12. Departure runway and links 13. Runway crossing links 14. Exit taxiway location 15. Holding areas 16. Airline gates 17. General aviation basing areas 18. Aircraft separation Pre-1985 IFR Separation Values 19. Route data Improvement #1 20. Iwo-way path data 21. Common approach paths 22. Vectoring delays 23. Departure airspace constraints 24. Gate hold control 25. Departure airspace constraints 26. Departure queue 27. Runway crossing delay control 28. Exit taxiway utilization Improvement #1 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Input Distributions 38. Demand 1983 Demand and Demand Input Distributions 38. Demand 1983 Demand and Demand Input Distributions 38. Demand 1983 Demand and Demand Input Distributions 38. Demand 1983 Demand and Demand Input Distributions	8. Time switch	
9. Airfield network 10. Number of runways 11. Kuhway Identification 12. Departure runway and links 13. Runway crossing links 14. Exit taxiway location 15. Holding areas 16. Airline gates 17. General aviation hasing areas 18. Aircraft separation 19. Route data 20. Two-way path data 21. Common approach paths 22. Vectoring delays 23. Departure airspace constraints 26. Departure airspace constraints 26. Departure queue 27. Runway crossing delay control 28. Exit taxiway utilization 29. Aircraft Operational Characteristics 28. Exit taxiway utilization Improvement #1 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 38. Demand 39. Demand and Demand Input Distributions 38. Demand		Configuration "B" (Westerly)
10 Number of runways 11. Kunway identification 12. Departure runway and links 13. Runway crossing links 14. Exit taxiway location 15. Holding areas 16. Airline gates 17. General aviation basing areas 18. Aircraft separation 19. Route data 11. Common approach paths 20. Two-way path data 21. Common approach paths 22. Vectoring delays 23. Departure airspace constraints 26. Departure airspace constraints 26. Departure queue 27. Runway crossing delay control 28. Exit taxiway utilization 29. Aircraft Operational Characteristics 28. Exit taxiway utilization 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Aircraft arrayal times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Loput Distributions 38. Demand	9. Airfield network	
12. Departure runway and links 13. Runway crossing links 14. Exit taxiway location 15. Holding areas 16. Airline gates 17. General aviation basing areas 18. Aircraft separation Pre~1985 IFR Separation Values 19. Route data Improvement #1 20. Two-way path data 21. Common approach paths 22. Vectoring delays 23. Departure airspace constraints 26. Departure airspace constraints 26. Departure queue 27. Runway crossing delay control D. Aircraft Operational Characteristics 28. Exit taxiway utilization Improvement #1 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Aircraft approach times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Input Distributions 38. Demand		
13. Runway crossing links 14. Exit taxiway location 15. Holding areas 16. Airline gates 17. General aviation basing areas 18. Aircraft separation Pre=1985 IFR Separation Values 19. Route data Improvement #1 20. Two-way path data 21. Common approach paths 22. Vectoring delays 23. Departing runway queue control 24. Gate hold control 25. Departure airspace constraints 26. Departure queue 27. Runway crossing delay control D. Aircraft Operational Characteristics 28. Exit taxiway utilization Improvement #1 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand and Demand Input Distributions	II. Kunway Identification	
13. Runway crossing links 14. Exit taxiway location 15. Holding areas 16. Airline gates 17. General aviation basing areas 18. Aircraft separation Pre=1985 IFR Separation Values 19. Route data Improvement #1 20. Two-way path data 21. Common approach paths 22. Vectoring delays 23. Departing runway queue control 24. Gate hold control 25. Departure airspace constraints 26. Departure queue 27. Runway crossing delay control D. Aircraft Operational Characteristics 28. Exit taxiway utilization Improvement #1 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand and Demand Input Distributions	12. Departure runway and links	
15. Holding areas 16. Airline gates 17. General aviation basing areas C. AIC Procedures 18. Aircraft separation Pre-1985 IFR Separation Values 19. Route data Improvement #1 20. Two-way path data 21. Common approach paths 22. Vectoring delays 23. Departing runway queue control 24. Gate hold control 25. Departure airspace constraints 26. Departure queue 27. Runway crossing delay control D. Aircraft Operational Characteristics 28. Exit taxiway utilization Improvement #1 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Input Distributions		
15. Holding areas 16. Airline gates 17. General aviation basing areas 18. Aircraft separation Pre-1985 IFR Separation Values 19. Route data Improvement #1 20. Two-way path data 21. Common approach paths 22. Vectoring delays 23. Departing runway queue control 24. Gate hold control 25. Departure airspace constraints 26. Departure queue 27. Runway crossing delay control 28. Exit taxiway utilization Improvement #1 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Runway crossing times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Input Distributions 38. Demand		
17. General aviation basing areas C. ATC Procedures 18. Aircraft separation 19. Route data 20. Two-way path data 21. Common approach paths 22. Vectoring delays 23. Departing runway queue control 24. Gate hold control 25. Departure airspace constraints 26. Departure queue 27. Runway crossing delay control D. Aircraft Operational Characteristics 28. Exit taxiway utilization Improvement #1 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 38. Demand 38. Demand 39. Demand 39. Demand 39. Demand 39. Demand 30. Demand 30. Demand 30. Demand 31. Demand 32. Demand 33. Demand 34. Demand 35. Demand 36. Runway crossing times 37. Lateness distributions		
C. ATC Procedures 18. Aircraft separation 19. Route data 20. Two-way path data 21. Common approach paths 22. Vectoring delays 23. Departing runway queue control 24. Gate hold control 25. Departure airspace constraints 26. Departure queue 27. Runway crossing delay control D. Aircraft Operational Characteristics 28. Exit taxiway utilization 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 38. Demand 39. Demand 1983 Demand and Demand Input Distributions	16. Airline gates	
C. ATC Procedures 18. Aircraft separation 19. Route data 20. Two-way path data 21. Common approach paths 22. Vectoring delays 23. Departing runway queue control 24. Gate hold control 25. Departure airspace constraints 26. Departure queue 27. Runway crossing delay control D. Aircraft Operational Characteristics 28. Exit taxiway utilization 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 38. Demand 39. Demand 1983 Demand and Demand Input Distributions	17. General aviation basing areas	
19. Route data Improvement #1 20. Two-way path data 21. Common approach paths 22. Vectoring delays 23. Departing runway queue control 24. Gate hold control 25. Departure airspace constraints 26. Departure queue 27. Runway crossing delay control D. Aircraft Operational Characteristics 28. Exit taxiway utilization Improvement #1 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Input Distributions	C. ATC Procedures	•
19. Route data Improvement #1 20. Two-way path data 21. Common approach paths 22. Vectoring delays 23. Departing runway queue control 24. Gate hold control 25. Departure airspace constraints 26. Departure queue 27. Runway crossing delay control D. Aircraft Operational Characteristics 28. Exit taxiway utilization Improvement #1 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Input Distributions	18. Aircraft separation	Pre-1985 IFR Separation Values
21. Common approach paths 22. Vectoring delays 23. Departing runway queue control 24. Gate hold control 25. Departure airspace constraints 26. Departure queue 27. Runway crossing delay control D. Aircraft Operational Characteristics 28. Exit taxiway utilization Improvement #1 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Input Distributions	19. Route data	
22. Vectoring delays 23. Departing runway queue control 24. Gate hold control 25. Departure airspace constraints 26. Departure queue 27. Runway crossing delay control D. Aircraft Operational Characteristics 28. Exit taxiway utilization Improvement #1 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Input Distributions		
23. Departing runway queue control 24. Gate hold control 25. Departure airspace constraints 26. Departure queue 27. Runway crossing delay control D. Aircraft Operational Characteristics 28. Exit taxiway utilization Improvement #1 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 39. Demand 1983 Demand and Demand Input Distributions	The state of the s	
24. Gate hold control 25. Departure airspace constraints 26. Departure queue 27. Runway crossing delay control D. Aircraft Operational Characteristics 28. Exit taxiway utilization Improvement #1 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Input Distributions	22. Vectoring delays	
25. Departure airspace constraints 26. Departure queue 27. Runway crossing delay control D. Aircraft Operational Characteristics 28. Exit taxiway utilization Improvement #1 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Input Distributions	23. Departing runway queue control	
26. Departure queue 27. Runway crossing delay control D. Aircraft Operational Characteristics 28. Exit taxiway utilization Improvement #1 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 1983 Demand and Demand Input Distributions		
27. Runway crossing delay control D. Aircraft Operational Characteristics 28. Exit taxiway utilization Improvement #1 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Input Distributions		
D. Aircraft Operational Characteristics 28. Exit taxiwav utilization Improvement #1 29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Input Distributions		
28. Exit taxiway utilization	27. Runway crossing delay control	
29. Arrival runway occupancy times 30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Input Distributions		
30. Touch-and-go runway occupancy times 31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Input Distributions		Improvement #1
31. Departure runway occupancy times 32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Input Distributions	301	
32. Taxi speeds 33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Input Distributions	louch-and-do runway occupancy tim	\$
33. Approach speeds 34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Input Distributions		
34. Gate service times 35. Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Input Distributions		
35 Airspace travel times 36. Runway crossing times 37. Lateness distributions 38. Demand 1983 Demand and Demand Input Distributions	34. Gate service times	
36. Runway crossing times 37. Lateness distributions 38. Demand and Demand Input Distributions		
38. Demand and Demand Input Distribu	36. Runway crossing times	
	37. Lateness distributions	
tions (Doggins & Frame Market	38. Demand	1983 Demand and Demand Input Distribu
tions (nequired from Task Force)		tions (Required from Task Force)

EXPERIMENT NO. 20

Objective:

To assess delays to aircraft in 1983 for the following runway configuration under IFR1 conditions, assuming that the upgrading of Opa Locka and Tamiami reliever airports has affected a 50-percent reduction in G. A. traffic at Miami.

ARRIVAL RUNWAYS

DEPARTURE RUNWAYS

27L, 27R

27L, 27R

Related Comparison Experiments:

Prior experiment 15 serves as the baseline for comparison to this experiment, wherein the conditions of this study case were identical except for the 50-percent reduction in G. A. traffic at Miami.

Remaining Data Items:

. General Aviation demand reductions for Class 1 (D), Class 2 (C), Class 3 (B), and Class 4 (A). (Total 50-percent reduction in G. A.)

SIMULA	TION MODEL INPUT	DESCRIPTION OF INPUT CHANGE
A. Logist	ics	
1. Ti	tle	
	ndom number seeds	
3. St	art and finish times	
	int options	
	rline names	
	ocessing options	
	uncation limits	
<u> </u>	me switch	
B. Airtie	Id Physical Characteristics	Configuration "B" (Westerly)
		(webterly)
	rfield network mber of runways	
TT. KU	nway identification	
12. De	parture runway and links	
	nway crossing links	
14. Ex 15. Ho	it taxiway location lding areas	
ودورون ومسورا	والمراجع والمناوي والمناوي والمناوي والمناوي والمناوي والمناوي والمناوي والمناوي والمناوي والمناوي والمناوي والمناوي	
	rline gates	
C. ATC Pro	neral aviation basing areas	
18. Ai	rcraft separation ute data	
	o-way path data	
	mmon approach paths	
	ctoring delays	
	parting runway queue control	
	te hold control	
	parture airsnace constraints	
	parture queue	
27. Rui	nway crossing delay control t Operational Characteristics	
28. Ext	it taxiway utilization rival runway occupancy times	
3(1		
31. Der	uch-and-go runway occupancy time parture runway occupancy times	
	ci speeds	
	proach speeds	
	e service times	
	space travel times	
	way crossing times	
	eness distributions	
	nand	50 Percent Less General Aviation

ATTACHMENT D

Miami Stage 2 Delay Experiments

Miami International Airport

Miami Airport Improvement Task Force Delay Studies

January 1979

1ABLE 9
MJAMI DELAY EXPERIMENTS
STAGE 2

Near-term Improvements	4	25% less 6.A.9	2, 75% Jess 6.A.9		toverflow parking	•	u						اد	
Near-teri Improvem	Pre-1985	Pre-1985	Pre- 1985	و	Pre-1985	Todays	Pre-1985	None	Pre-1985	None	None	Post-198	Post-198	None
ATC System b Scenario	Pre-1985	Fre-1985	Pre-1985	Todays	Pre-1985	Todays	Pre-1985	Pre-1985	Todays	Todays	Post-1985	Post-1985	Todays	Todays
Demand	Pre-1985	Pre-1985	Pre-1985	Todays	Pre-1985	Todays	Pre-1985	Pre-1985	Pre-1985	Pre-1985	Post - 1985	Post-1985	Post-1985	Post-1985
Weather	VFR2	VFR.	VFR	IFRI	VFR1	n,à.	n. ė.	n.a.	. .	n.e.	л. В.	n.a.	n.a.	n.a.
Departure Runways	27L, 27R, 30	9L, 9R, 12	91. 98. 12	27L, 27R	.27L, 27R, 30	.a.	-1.a.	n.a.	n.a.	n.a.	n.a.	n.a	n.a.	n.a.
erivel Runways	27L, 27R	94. 98. 12	91. 98, 12	27L, 27R	27L, 27R, 30	n.a.		n.a.	n.b	. 4.0	. a.a.	n.a.	n.a.	n.a.
Study	m <i>.</i>	~ •		ın i	~	7. E	n. 4.	. P.		ė	¥.	n.è.	n. b.	n. š .
Mode	ASK	ASA.	ASH	ASM	S	Y		ACA.	T C		Ş	7	2	Ą
Experiment Number	97	2 8	2:	7	\$2	2;	2	28	8 (€ 2) S	7 ?	7	3

Study cases are defined in Figure III-1 of the Miami International Airport Technical Plan (October 1978).

D-2

^bFAA will describe impact of pre-1985 and post-1985 ATC systems on model inputs (as per report No. FAA-EM-78-8A).

Postential near-term improvements are identified in Appendix B of the Miam! International Airport Technical Plan,

dairfield Simulation Model,

Task Force will establish packages of near-term improvements most likely to be implemented in the pre-1985 and post-1985 time frames. Improvements to runways 9L/27R, 9R/27L, and 12/30 identified as improvements 1, 2, and 3 in Appendix B of the Technical Plan are most likely to be included in the pre-1985 improvements.

greduction in general aviation achieved by upgrading Opa Locka and Tamiami General Aviation Reliever Airports.

Annual Delay Model.

improvement #6 is the use of 2 mile in-trail staggered parallel approaches.

 $^{
m J}_{
m Improvement \ FB}$ is the overflow parking positions within the terminal area,